

NATURE MAGAZINE



APRIL 1934

35¢

VOL.17, NO.4

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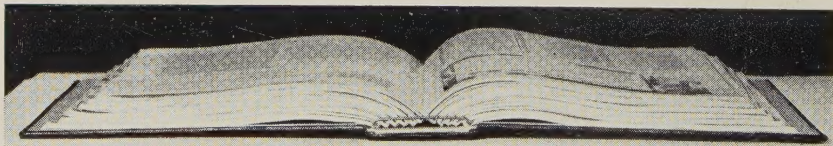
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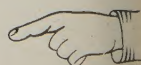
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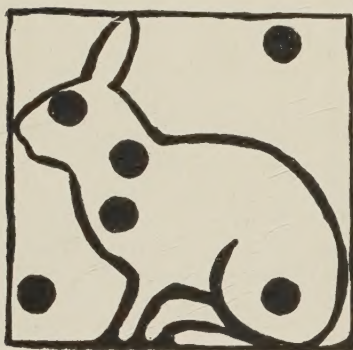
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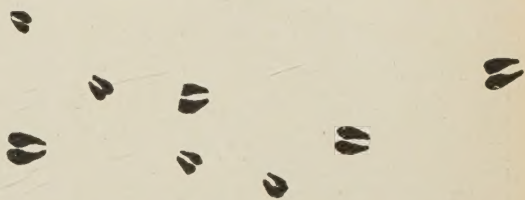


How Much Do You Know About Woodcraft?



How well do you see? Are your eyes really as strong and accurate as you think? Have you ever tried this interesting Rabbit-trail? It is only one among thousands of valuable helps to the woodsman, hunter and outdoor man—with which these books are crowded.

Scenes like these are the very essence of woodland fascination. This sketch by Ernest Thompson Seton himself shows a baby raccoon being spanked up a tree by his mother. It is one of over 1450 drawings and photographs contained in this set of books covering every phase of outdoor life.



Deer tracks—another sketch from THE LIBRARY OF PIONEERING AND WOODCRAFT, by Ernest Thompson Seton. Do you know the thrill of coming upon these marks in the wilds? Of recognizing them? Of following them with gun or camera? Let this master woodsman tell you how to read the marks beasts leave behind them, for you to trail.

All you need to know to make the out-of-doors your home is contained in these six books. Here are definite instructions for finding natural foods. Pictures to help you identify flowers, birds, trees and animal tracks. Games to be played in camp. Pastimes for the camp fire circle. Lists of necessary equipment for long or short excursions into wild country. First aid treatment. What to do if you lose your way. A veritable college course in the school of nature!



HOW good a woodsman are YOU? Are you at home in big timber, in the mountains, in a frail canoe on lakes or streams? Can you light a fire without matches? Can you tie all kinds of knots? Can you make a dial—quickly, with materials at hand? Can you lay a good cooking fire? Identify the birds? Tell the difference between edible mushrooms and toadstools? Recognize poison? Erect a tepee? This marvelous set of books tells you how to do all of these things—and countless others. *Tracking and Canoeing* covers every phase of those two sports, from equipment and directions for achieving the utmost comfort on the trail or stream to the handling of small craft and rapids, etc., etc. *Animals and Birds* tells its own story. Tracking, taxidermy, hunting with both gun and camera. *Indiancraft* is full of the lore of the first and best of all woodsmen. Sign language, ceremonials, blazing trails, etc. *Woodcraft*, stories of adventure, instructions for erecting waterproof shelters, living on the land, *seeing* with both eyes everything that is before you. *Earth and Sky*, rather forecasting, romance of the flowers and shrubs and trees. How to find your way by natural signs, "compass-golden-rod," moss, trees, the stars at night. Contains maps of the heavens, etc., etc. *Wild Animals!*

Nature's Own University

No one knows more about outdoor life than Ernest Thompson Seton. No one has studied

the lives of Indians and pioneers more carefully. No one has a greater or more sympathetic knowledge of the beauties and wonders of nature—flowers, trees, birds, small winged creatures, wild and domestic animals.

He wrested this knowledge from Nature herself, by living in the open and through years of intimate contact with the American Indians.

Everyone who loves the out-of-doors will find these the most fascinating and valuable of books. Master woodsman and master story teller, Ernest Thompson Seton always has something new and interesting to tell you. Here are over 1700 pages of interesting information and entertainment: Woodland lore, adventure tales, animal stories, Indian songs, dances, ceremonials, pioneer tales and specific instructions covering every phase of life in the open.

Examine These Books—FREE

Without cost or obligation on your part, we will gladly send the six volumes of The Library of Pioneering and Woodcraft, beautifully bound in National Blue Cloth and profusely illustrated with more than 1450 photographs and drawings by the author, for 5 days' inspection. Return them at our expense if you choose, or send only \$1.00 first payment, then \$2 a month till a total of \$11.00 has been paid, an astonishingly low price for

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Gentlemen:—Please send me for free examination, The Library of Pioneering and Woodcraft (6 vols.) by Ernest Thompson Seton, illustrated with more than 1450 drawings and photographs by the author, and handsomely bound in National Blue Cloth. I shall either return the books within five days or send you only \$1.00 as first payment, then \$2 a month till the full price of \$11.00 has been paid.

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Mt. Shuksan from Mt. Baker Lodge, Washington



Edited By
RICHARD WILBUR WESTWOOD
Director of Field Trips
Nature Magazine

Already more than two thousand copies of "On Western Trails", describing the Nature Magazine western trips, have been sent to those who have inquired about these outdoor jaunts. Undoubtedly more people will wish to consider these trips in connection with their vacation plans for the coming summer. They are well worth considering. Write to Director of Field Trips, American Nature Association, 1214 16th St., Washington, D. C.

Vacation Vistas

Look upon mountains, lakes, forests and streams from the window of your luxurious chalet or cozy cabin.

Hospitable resorts in the Cascades and Olympics of the Pacific Northwest include Paradise Inn, Rainier National Park; Big Four Inn, in the Cascades; Quinault Hotel, in the Olympics; and Mt. Baker Lodge, in Mt. Baker National Forest.



175

If you are interested in a Western vacation this summer, send for free booklet, indicating kind of outing you wish. Address E. E. Nelson, 391 Northern Pacific Railway, Saint Paul, Minnesota.



This Album, Free!

For Travel in the West—

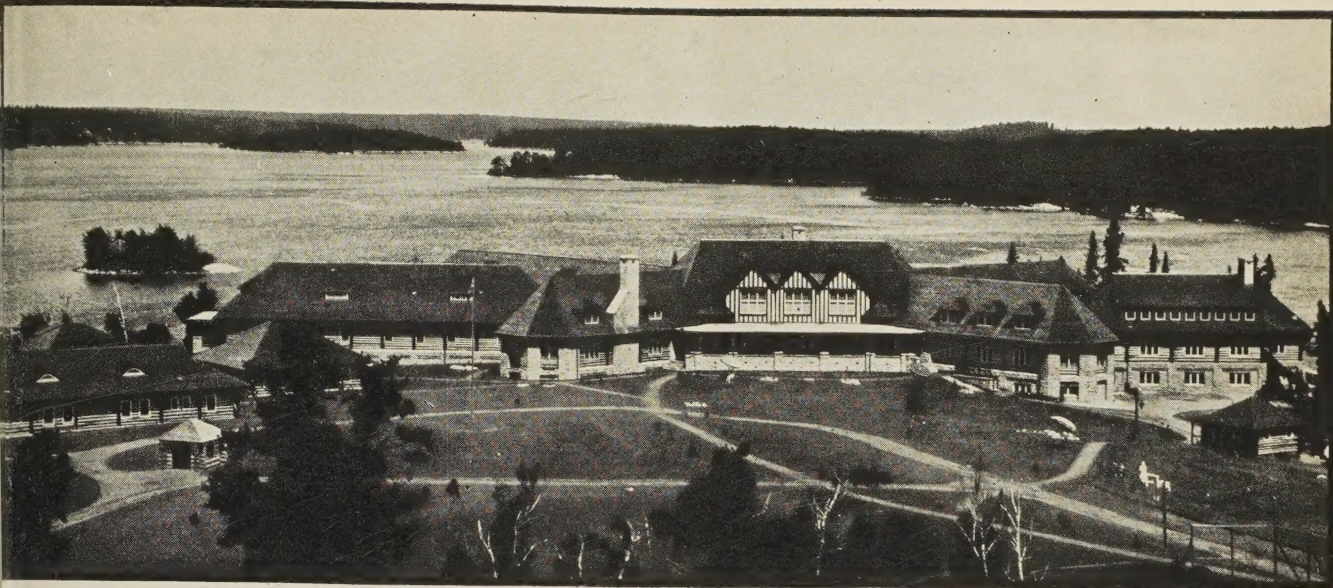
North Coast Limited

Newest of Transcontinental Trains

BEING on the receiving end of travel literature has its advantages and its disadvantages. On the credit side is the enjoyment of reading attractive printed matter, looking at lovely pictures and taking vicarious journeys about the world from one's office chair. Chiefly on the debit side is the inability to stick one particularly attractive folder in one's pocket, cash a check and speed away to distant places.

After all, however, we've been rather fortunate in being able to see quite a bit of this continent and Europe. And to travel at all is to nurture always the desire to travel more. How many have said, silently or audibly, "If only I had an independent income, I'd start travelling and never quit!" Probably they wouldn't do quite that because one of the chief joys of travelling is coming home and looking forward to the next trip. But we hope we will never get over a thrill at train departures with the last scurry, clanging of Pullman doors and inaudible conversations through car windows; or the lift it gives us when a great trans-Atlantic liner, rails a'brim, is eased away from her pier and noses toward the sea.

All of which brings us around to some of the travel literature that has recently come to us and has already put the old vacation urge on edge. Few can vie with the booklets gotten out by our own western railroads and those in neighbor Canada. The Canadian National with glorious Jasper National Park to offer; the Canadian Pacific with famous Banff and Lake Louise; the Great Northern with incomparable Glacier National Park; the Northern Pacific with the varied charms of Yellowstone; the Chicago, Milwaukee and St. Paul with both Yellowstone and Mt. Rainier as offerings; the Union Pacific with Yosemite and the bizarre Utah parks; and the Santa Fé with the Grand Canyon—what a wealth of material they have to write about, and they do it well.



MINAKI

in CANADA's pine-clad Lake-of-the-Woods region

*Silver streams, sparkling
lakes, fragrant forests and
every form of summer sport.*

"MINAKI" is an Ojibway Indian word. It means "beautiful country"—for this wonderful Lake-of-the-Woods region cast the same spell on the Indian centuries ago that it casts on the white man today.

In the heart of this land of lakes and streams, Canadian National has built Minaki Lodge. Here is a golf course ringed by cool pine woods. Here are tennis, fishing, swimming, motor-boat-ing, canoeing, aquaplaning . . . islands to visit and rivers to ex-

plore . . . Here at night are blazing fires, delightful dinners, gay dancing, charming companionship.

Send for booklets about this perfect North Woods vacation. Or ask any of the Canadian National offices listed below, to arrange for you *free* showings of Minaki and other Canadian films in your club or your church.

* * * *

Canadian National takes you everywhere in Canada. It operates 23,000 miles of railways, steamship lines, telegraph and express services and 14 broadcasting stations. Its hotels, camps and lodges stretch from one end of Canada to the other.

CANADIAN NATIONAL

The Largest Railway System in America

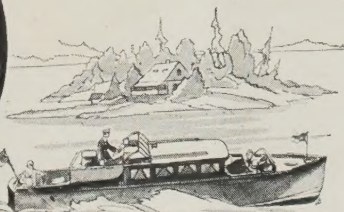
Minaki
fishing,
boating, fish-
ing tempt
you to be on
the water all day.



You can step
on Minaki's
broad
sandy to
perfect
course on the
best's edge.



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Lake Ellen Wilson from Gunsight Pass

The modern back-to-nature movement is a trip to Glacier Park!

Into the saddle and back to nature—here where glacier-crested peaks are rival skyscrapers, where wild life means bear grass in blossom, a close-up of a mountain goat, a marmot's whistle, or a lake alive with fish and reflections of the grandeur that is Glacier Park! The open is the place for you. Write Great Northern Vacations, St. Paul, for details.

The New
EMPIRE BUILDER



The Luxurious
ORIENTAL LIMITED

Closely rivalling our own railroads, with fine and useful literature which has a different story to tell, are several of the foreign railroad systems. Notable is the Great Western and Southern Railways of England with a group of valuable booklets for any traveller. "England . . . and Why?" certainly answers the question: the title propounds, and "Ireland, Gem of the Sea" awakens in us that old urge to see the Blarney Stone.

Possessed of a scenery historic in its lure, the Swedish State Railways have no excuse for not getting out literature that fairly drags one down to the steamship agent's office. This railway system need make no apologies for the lovely booklets that are produced to attract our American dollars into Swedish kronor. Nor have the Swiss Federal Railways overlooked any opportunity to make one wish to exchange our dollars for Swiss francs. To the fortunate fellow with lots of both money and time it all must mean a real problem.

Looking westward—in our pile of travel folders—we find one that will always make us restive until we are able to do something about it. This is the booklet about Alaska, Atlin and the Yukon. If one loves mountains—unscaled, glacier-ridden, majestic—and we do, this country is bound always to be a lure. We'll make it, one day—maybe we'll take one of the Nature Magazine parties up there.

Hawaii we've never seen and it's high on our list of places to go when we get that independent income or can save up enough money. They tell us that it is just about perfect all the year around. However, the Matson Line and the Los Angeles Steamship Company both tell the story in their booklets better than we could. Do you want to hear it?

Then there is the Gulf of St. Lawrence, Gaspé and Newfoundland, to which a Nature Magazine party may go this summer (if enough are interested), and certainly will go in 1932. The Clarke Steamship Company and the Canada Steamship Company both sell the charms of this land with great effect in their literature. Nova Scotia attracts us also because our grandfather tried to run a farm there once—with indifferent success.

And with all of these places—and more—to consider we find one organization standing sort of like a guardian angel of travel—the American Express. Vacation "home" to myriad globe-trotting Americans, it has a ready answer to all questions. Its literature, such as "European Travel Guide" and "The American Traveller in Europe", are really valuable documents.

We've just wandered along—as it's plain to see—writing this department and we admit it has got us all upset. We'd like to surround ourselves with plans of ships and schedules and such and start planning. But this is only March and there's work to be done and Western Trail Trips to launch—if one can be said to launch trail trips. So we'll have to leave it to you and if you'll have some of the information we've talked about here let us know.

At LAKE LOUISE

... every minute some new thrill!



HEER, sparkling beauty! Out over an Alpine flower garden... poppies and Spring flowers in July... to a jewel lake mirroring Victoria Glacier and luminous snow-capped peaks... now amethyst, now opal, now jade. You'd like to look forever at this exquisite picture... framed by the Chateau's great arched windows! But the altitude gives you so much *zest* to do things. Easy trails lead to the Lakes in the Clouds... sure-footed mountain guides carry you to the Plain of Six Glaciers, Valley of the Ten Peaks. Smooth motor highways lead to Moraine

Lake; to Banff Springs Hotel, Emerald Lake Chalet, the Yoho, Castle Mountain and Lake Wapta Bungalow Camps... Too, there's the open-air Grecian swimming pool... fast tennis courts... Swiss guides... saddle horses... boating. *Then at night!*... A royal dinner... lilting dance music, and a *fond bonne nuit* to the magic, moonlit lake.



Come up to Lake Louise this Summer!

Special reduced rates—10% to 20% less for 2 weeks stay, or a month or longer. European Plan—for room with bath, *single*—\$7.00 up per day; *double*—\$12.00 up. Suites for one person \$20.00 up; for two, \$35.00 up. All rates slightly higher through July and August. But plan to stay all season—(with part time at Banff Springs Hotel.) *Chateau Lake Louise opens June 1.*

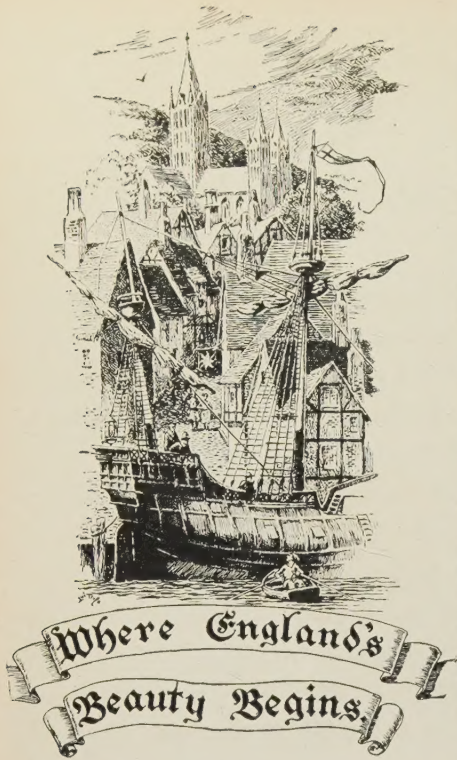
CHATEAU *Lake Louise* IN THE CANADIAN ROCKIES



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Wester Ave. CINCINNATI	201 Dixie T'm'n'l Bldg. CINCINNATI	71 E Jackson Blvd. CHICAGO	1231 Washington Blvd. DETROIT	611 2nd Ave. So. MINNEAPOLIS	412 Locust St. ST. LOUIS	675 Market St. SAN FRANCISCO

Also reservations, rates, information from Chateau Lake Louise, LAKE LOUISE, Alberta. Or from offices in other large cities of United States and Canada.

ARE PACIFIC COAST EXCURSIONS—MAY 15—SEPT. 30. ASK FOR PACIFIC COAST TOURS, CONDUCTED TOURS FOLDERS



It was the Devon tides that first brought news of England's rising sea power. Even though Fowey is pronounced "Foy", she is proud of having sent forty-seven ships to the siege of Calais against London's twenty-five. A tumble of ridges and ravines takes you to Fal-mouth where the Greeks came for hides and the French for revenge.

You can gather wild rose sprays in June on sunny Devon hedgerows. The green barley grows deep along the fields. The grasses begin to be tinged with the soft hues of their bloom and ox-eye daisies flourish in white companies. There are dapplings of the elder's creamy blossom on some of the hedges and the broom flowers follow the gorses in a blaze of gold.

In palm-bowered Cornwall a day's rain is a news event. You feel as Sir Francis Drake must have felt three hundred years before when you admire the grizzled sea dogs who man the fleets of Britain. The West Countrie of England is as characteristic as Chaucer. An old mansion in which Effingham and Hawkins may have caroused, watches you warily as you drive your ball into a ring of evergreens.

Illustrated Guide No. 11 will be gladly mailed if you write to

G. E. ORTON, General Agent, 505 Fifth Ave., N. Y.

**Great Western
and
Southern
Railways
of England.**

A Queer Wren's Nest

When a pair of wrens set up housekeeping in West Park, New York, they followed wren tradition neither in location nor in construction of their nest. The place they picked, according to James Reynolds of Poughkeepsie, was the chicken house of Mrs. Gilbert Drake, and for materials they used small pieces of rusted chicken wire together with the usual collection of twigs. An old horse collar hanging on a peg in a



corner of the house furnished the base for the nest, and the chicken wire was used to fill the entire corner space between it and the ceiling, except for a very small opening to the nest. When the chicken-house door was closed, the only access to the home was a one-inch gap in a poorly-fitted window, but the birds seemed to experience no difficulty in attending to their parental duties. These wrens were probably the only ones of their kind who ever went to roost with the chickens.



Harry C. Morr
PRES. & CO. OF MORRISON HOTEL



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High**

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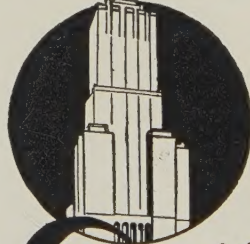
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Earth's Most Fascinating Scenes

concentrated in one corner of the West... fantastic Bryce... majestic, colorful Zion... vast incredible Grand Canyon. See these three National Parks and Cedar Breaks, Kaibab National Forest as well in one 5-day motor bus tour.

For Vacation Ideas, Come to Union Pacific

No other railroad has so much to offer the vacationist. Practically every vacationland of any note in the West is reached directly by Union Pacific, which serves 15 National Parks and more of the scenic West than any other railroad, including

**Zion-Bryce-Grand Canyon
Yellowstone-Grand Teton
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Colorado
California and Hawaii
Pacific Northwest and Alaska**

This summer, make it a comfortable vacation. Go to your vacationland by train. Avoid delay, discomfort en route. Enjoy delicious meals, restful sleep via Union Pacific. You gain extra days to spend in the glorious West, where they count most.

Take advantage of low summer fares with liberal stopover privileges. At little more than half usual rail fares, via Union Pacific, you can visit any of the forementioned regions.

Let us also tell you about our all-expense escorted tours. You see most and see it most economically.

Write today for free illustrated booklets about any of our vacation wonderlands.

J. P. Cummins, General Passenger Agent, Room 47
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UNION PACIFIC SYSTEM

THE TRIP OF THE YEAR



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is in the

Northwest Wonderland

Experience all the grandeur, gayety, thrills of America's foremost Adventure Land. New companions you'll like . . . wilderness-wise guides . . . on the all-expense tour that gives most . . . only \$145 and up from Chicago. Just like a big house party. Or travel independently . . . low Summer Fares.

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OLYMPIAN

Roller-bearing transcontinental queen . . . joltless, jarless, sootless, cinderless riding ease. Glide over the Belts, Rockies, Bitter Roots, Cascades by day. Open observation cars. Meals by Broadway-famed Rector.

There's only one Olympian!

Let our travel specialists tell you more about the "trip of the year" . . . help you plan.

Geo. B. Haynes, Passenger Traffic Manager
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The MILWAUKEE ROAD

• ELECTRIFIED OVER THE ROCKIES TO THE SEA •

ONE KNOWS THEM BY THEIR HABITAT

Those persons who always do things well . . . one knows them by their habitat ✓ They have a definite capacity for living amid the niceties of life without sacrificing any of the material comforts . . . and that at moderate cost.

They may be found swimming on the Côte d'Azur . . . applauding Toscanini at Baireuth . . . making a pilgrimage to Oberammergau ✓ At home—in the Barbizon-Plaza library reading Aldous Huxley . . . in the Barbizon Concert Hall listening to Homer, Gabrilowitsch or Gieseeking . . . viewing the worth-while in art, in the Barbizon Petit Palais des Beaux Arts located on the mezzanine or, dancing in Les Charmettes—to the muted modern rhythms of Nelson's Orchestra during dinner and supper ✓ This is the spirit of Barbizon-Plaza.

Of course the building has radio in every room and many other conveniences, is located within a block of Fifth Avenue and one block from Fifty-seventh Street, and is the center of New York's Art and Music Life and is convenient to theatres and shops.

...

THE CONTINENTAL BREAKFAST is placed in a special recess in your door—in sealed container that keeps everything piping hot. No waiter to interrupt in the midst of a shave or shower. No charge. No tip. No delay. Pick it up when you are ready.



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Room, CONTINENTAL BREAKFAST and
BATH . . . \$20 to \$45 weekly
Transient Rates . . . \$3.50 to \$6.00 daily

THERE WAS HER LETTER



WAITING FOR HER IN VENICE

And now Venice! For three weeks she had been traveling in Europe . . . Paris, Lucerne, Geneva. She herself had hardly known where she would be next . . . and the folks at home! How were they to know? And, too, how she longed for a word from them.

At parting she had told them: "Write care of the American Express, London." Little did she know what that was to mean to her later. She had thought only of London or Paris. She did not know how widespread was the American Express service in Europe. But she soon learned.

She asked for her mail in Venice. Her letter was there! . . . It had fol-

lowed her from London to Paris, from Paris to Geneva, and on to Venice.

All along the route this lone woman traveler had been assisted by the American Express organization.

At Southampton a solicitous courier in American Express uniform had helped her to her boat train. At London she had arranged for her tour of England. At 11, Rue Scribe, Paris (the Company's office), she had secured her travel accommodations for Switzerland and Italy. On entering Italy an American Express interpreter had helped her with the troublesome details of the customs.

But it was this letter in Venice that brought home to her the completeness of American Express service.

Naturally, it was an American Express man who at the conclusion of her European travels, saw her safely on her steamer bound for home.

Her trip had been "thrilling," but it was made so by the experienced help of the travel men in the American Express offices wherever she went.

She had made sure that she would be entitled to this helpfulness before she left home, by changing her travel money into the convenient American Express Travelers Cheques.

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52

Please send me information on a trip to _____
 leaving about _____ lasting _____ weeks.
 Name _____ Address _____

Mention NATURE MAGAZINE when answering advertisements

WESTERN TRAILS

VOLUME 1

APRIL, 1931

NUMBER 3

PERSONALS

Helen Dolman, Glacier '29, has a new wine-colored roadster. It has "a rumble for rain", she writes.

"Peattie" Crisp, Glacier '29-Jasper '30, showed Unka Walt (Jasper '30) Little's Jasper-Inner Passage movies to a breathless group of 20 recently.

Bertha Lou Hoffman, Glacier '29, is teaching in Clarion, Iowa. It's departmental work, she writes, and she likes it.

Mabel Egbert, Yellowstone-Glacier '30 makes swell candy. Ask Paul Hannah and Russ Edwards, Yellowstone '30.

Seen at 42nd and Broadway, Dorothy Jameson, Jasper '30, rushing for a Jersey bus after seeing "Three's a Crowd".

Warren Wilson, Glacier, Jasper '30, the second youngest Vagabond, stood first in his form for the semester. Which proves what association will do.

Irene Scott Nichols, Glacier '30, now pursuing the lights of learning in the historic halls of Cornell, vehemently denies that she has had a date every night since school began.

Helenita Topping, Glacier '29, flew to Washington in a little plane piloted by her future lord and master and spent the Washington Birthday weekend with Eddie and Dick Westwood, Glacier '29, Jasper '30.

"Western Trails" is the Alumni Bulletin of the Vagabonds of the Trail, the folks who have followed the trails with the American Nature Association. It is dedicated both to those who have graduated from these fine summer experiences, and to those who have indicated an interest in the trips but who have not yet graduated from a trail trip

WINTER CRUISE PROVES JOY TO PARTY

Spirit and Fellowship of Western Trips Prevail

"My own feelings about this trip," wrote Arthur Newton Pack, President of the American Nature Association, from the *S. S. Caledonia* en route from Jamaica to Panama, "seem to be shared by all of our party—a succession of glorious smooth days and moonlight nights of dazzling brilliance; hours that flit by with no reading done, no letters written, but pleasant conversation and growing camaraderie among the members of a group of thirty-three persons who have been drawn by much the same reason to join the Nature Cruise. Those thirty-three come from all walks of life. Each seems surprised to find the others just a little more worth knowing than he had expected. With the ease of acquaintance

possible on a ship at sea, with no effort made to exclude outsiders, each of us comes to decide that our Nature party represents the best of a shipload of over four hundred persons."

From this we gather that the members of our first winter cruise had a grand time. And Mr. Pack has touched on one thing which seems to be typical of the Association's parties—the camaraderie and democratic fellowship of all. We can only conclude that Nature Magazine goes to a certain kind of folks—a group, albeit large, whose interest in the outdoors and what it holds sets them somehow apart. This has been the experience of the trips to the West. It is this feeling that has made all want to come together again and meet as they did at the Vagabonds of the Trails reunion.

Already the question has been asked whether the winter cruise will be repeated in 1932. Undoubtedly it will, and with improvements and variations which will be the fruit of this trip.

"WESTERN TRAILS" MAILED TO ALL INTERESTED

Booklet Describing Trips for 1931 Now Completed

More than two thousand copies of "On Western Trails" have been mailed out to folks who have been interested in the American Nature Association's trips in the past or who have inquired about them in the last few weeks. We hope that the address list has been as it should be, but if by chance you have not received your copy of this booklet describing the trips when this page appears let us know right away.

In preparing the booklet for 1931 we have endeavored to include all details that we might imagine to be necessary. It has not been possible, of course, to go into extended description of the things one will see and do on the several trips. Words wouldn't serve the purpose anyway. Undoubtedly, however, there are details overlooked, questions about possible combinations of these trips with other plans of the individual and other points not covered. Just write the Director of Field Trips about any of these.

VAGABONDS OF THE SPANISH MAIN

Members of the Association's West Indies Cruise

Left to right, standing: Dr. Wm. E. Lower, Mrs. James B. McDonough, Mrs. Tom Gill, Mr. A. J. Connell, Dr. A. S. McQuillan, Mr. James B. McDonough, Mr. Tom Gill, Miss Madeline Hollis, Mr. Loring Lane, Mrs. Landon W. L. Edmonds, Mrs. John H. Hollis, Mrs. Wm. E. Lower, Miss Helen Danker, Mrs. Loring Lane.

Left to right, seated, second row: Mrs. W. R. Hunter, Mrs. W. W. Metcalf, Mrs. Louise Legore, Mrs. Frank Niepold, Mr. Arthur Newton Pack, Mrs. Arthur Newton Pack, Mrs. A. S. McQuillan, Miss Minna P. Bolze, Mrs. Wm. Reade Hersey, Mrs. Julia T. Eastman, Miss Anna D. Bradley.

Left to right, seated, first row: Mr. Wm. Reade Hersey, Mr. Warner Holt, Mr. C. Falkner Kendall, Mr. George Crosbie, Miss Margaret McQuillan, Dr. George L. West, Mr. Charles H. Milliken, Mr. Arthur W. Raynor, and Mr. Wm. McAvey.



TRUMPETER OF THE SWAMPS.

WHOOPIING CRANE, RAREST OF AMERICAN CRANES — UTTERS A LOUD TRUMPET-LIKE CALL WHICH CARRIES LONG DISTANCES — THIS NOTE IS MADE POSSIBLE THROUGH AN UNUSUALLY LONG WINDPIPE, OVER A FOOT OF IT BEING CURLED UP IN THE HOLLOW OF THE BREASTBONE.



Curious Creatures

The thousands who have become interested in that worthwhile newspaper feature, "Curious Creatures", which, syndicated through the King Features Syndicate, reaches about 3,000,000 people daily, are undoubtedly unaware that Richard Addison, its author, is primarily not a writer or cartoonist, but a zoologist. Each day he prepares a small sketch of an animal, bird, reptile or plant and concisely points out some peculiarity or interesting feature of the subject, couching his explanation in terms that all can understand. Mr. Addison's motive is mainly to teach—he feels that "Curious Creatures" may be an introduction to Nature to some, and to others an "Open Sesame" to a land they have glimpsed from afar. He has been a Nature lover since boyhood. As former assistant director and curator of mammals at the San Diego Zoological Garden, and former director of the William Randolph Hearst Zoological Garden, he is especially equipped to dispense accurate, yet interesting Nature information.

A Racing Coyote

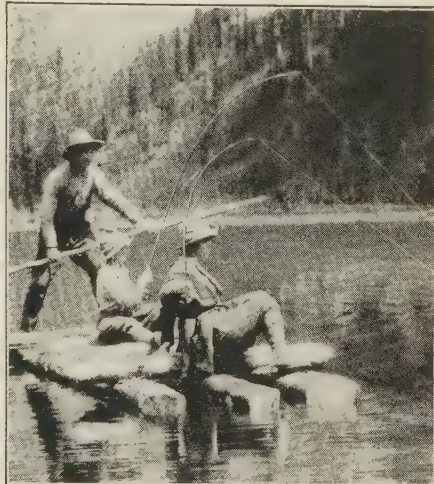
A race with a coyote in which the much-hunted western predator picked up his speed to 35 miles an hour was experienced recently by Joseph Joffe, Assistant Superintendent of Yellowstone National Park, travelling by motor over the snow to the buffalo ranch one day last winter. The coyote first challenged the automobile near Lake LaCombe, where it was surprised as the car rounded a turn. Instead of following its companion, who hit for the woods along a game trail, it sped along the road just ahead of the bumper. Mr. Joffe writes in *Yellowstone Nature Notes*: "Mrs. Joffe watched the speedometer, and at no time did it record less than 25 miles an hour. The maximum was 35. He looked like a big police dog racing in front of the car, and his running was indeed beautiful. When I would step on the gas, he would get out a little more steam. At one time, when I was almost upon him, I blew my horn. He suddenly reeled, made a dash at the car, but quickly turned and continued his running. The last time I blew my horn he jumped out of the road and his danger was over. He immediately reversed his direction and sped back over the road he had just traveled."

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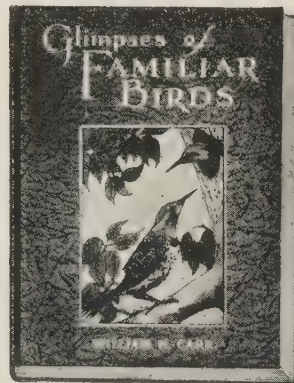
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To Stimulate Public Interest in Every Phase of Nature and the Out-Of-Doors, and
Devoted to the Practical Conservation of the Great Natural Resources of America

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The RANGER-NATURALIST

An Editorial

IT WAS our privilege, two years ago, to explore Glacier National Park under the guiding wing of a National Park Ranger-Naturalist. We rode the trails with him for nine days while he unravelled before our city-wearied eyes the skein of beauty Nature has hidden in this great preserve. With skilful phrase, he re-pictured for us the aeons during which the mountains were wrinkling and the cobalt lakes were born. His keen eyes found us mountain sheep and goats among the ledges; his wide knowledge compassed the flowers and the birds along the way. He knew when and where to take us to see the beaver at work, and where the water ouzel bubbled forth its cascade of song. He answered all our questions with calm courtesy.

Around the nightly campfire, he brought to us in song and story the romance and exuberance of the West; at the noon-tide siesta, he would perhaps gather us under the shade of a twisted yellow-pine to hold us spell-bound with revelations of insect life, driven home by the dissection of a deer-fly. The midnight moon might find him perched at the pinnacle of some peak, singing snatches from the operas, or giving a sky-talk enriched by copious reference to classic myth.

The fire of his enthusiasm welded us to the National Park idea and out-of-doors as nothing before had ever done. We returned to the East inspired by a new understanding of the greatness of America and the magnificence of its beauty. We returned filled with gratitude for the opportunity given us and every other American by the National Park Service to see great scenic wonders through the trained eyes of the Ranger-Naturalist.

A visitor to the parks fifteen years ago possessed no such opportunity. He had to be content with sight-seeing tours enlivened by the jokes of Munchausen-minded guides who did not know a marmot from a cony. While this satisfied the "gape-and-run" variety of tourist, it pleased neither the curious-minded who went back home with thousands of questions unanswered, nor the Park Service officials, who realized the wealth of natural history latent in the parks. About 1918, resort managers at Lake Tahoe, California, employed a young naturalist named Harold Bryant to interpret Nature to their guests, and the late Stephen T. Mather, then director of the Park Service, became so impressed with the possibilities of Dr. Bryant's work that he brought him to Yosemite, where his success with the public was immediate. Other

ranger-naturalists were appointed in other parks, and the Educational Service, which the same Dr. Bryant now heads, was built up as an important phase of National Park work.

The Ranger-Naturalist Service has gained prominence more or less by lifting itself by its own bootstraps. By "exposing" the visitors to Nature teachings, it created a demand for knowledge of the out-of-doors it could meet only by expansion. Park men say that during the past decade, a new seriousness and desire to learn and understand has developed among the tourists. This changed attitude has been inspired to a considerable extent by the ranger-naturalists themselves and the National Park leaders have been quick to cater to the new spirit by larger naturalist staffs.

The traveling public is apt to take the Ranger-Naturalist Service for granted, without fully appreciating the labor and effort that lie in back of its work. Few realize the elaborate system of lectures, field trips, museums, auto-caravans and moving picture exhibitions by which it is hoped to inoculate the germ of Nature love into the visitors. In Yellowstone, for example, where seventeen rangers met 227,801 people 686,674 times in 1930, eleven lectures are given each evening, and twenty-five field trips are conducted each day. Five museums and miles of Nature trails have been prepared to capture the public's interest and satisfy its curiosity.

Few appreciate, too, the extraordinary qualities a successful Ranger-Naturalist must have. He must be grounded in all branches of science. He must be a psychologist, a Nature lover, a poet, teacher, artist and leader. He must have the patience to reply to obvious questions from dawn to dark, and the skill to frame his answers and his lectures to meet the intellectual levels both of the layman and the visiting trained teacher or scientist. More than this, he must have that rare ability to inspire others with the enthusiasm he feels for America's wonderlands.

To see a National Park in the company of a Ranger-Naturalist is both a privilege and an opportunity; and the wealth of vacation experience to be derived from such a trip cannot be measured in terms of dollars and cents. If Americans realized how fortunate they are in the parks and the service maintained there, they would visit them much more frequently. They would do as we hope to do, summer after summer—travel westward where our questions are dissolved into inspiration that survives the summer tan—and even the picture album.



THE RUFFED GROUSE "STRUTTING TO AND
FRO ALONG A MOSS COVERED LOG"

DOWN STREAM

BY E. CHESLEY ALLEN

ILLUSTRATED BY R. BRUCE HORSEFALL

LIKE a fine-spun thread of silver and old gold the little brook runs through the tapestry of boyhood memories. Flowing from a mill-pond two miles above the village, it doubles about gray old granite boulders, skirts the edges of sapling ridges, loses itself in the deep shade of spruce and fir thickets, and, halting for a moment to do homage to the old lichen-covered maple that still stands sentinel at its last bend, mingles with the salt water of the little tidal river.

This morning as I come upon it near its source it is singing the merriest of songs, just in tune with the magic of the late May morning.

Trout there will be few, for years ago the little stream had been fished out; but there is much more in fishing than the catching of fish, and this is one of the mornings when all Nature is on tip-toe, and the promise of sweet adventure is in the air, stirring the pulse and imagination.

The tamaracks are putting forth soft gray-green tassels, alder catkins shower golden pollen at the least touch, cinnamon ferns are sending up their brown fertile fronds, and the three uncoiling talons of the eagle brake are vindicating its name. The pussy-willows have long passed their gray furry stage, and now on this bush the withered stamens hang limp and dead, their duty done; but just there across the brook its mate is developing plump seed pods that shall presently burst into clouds of downy seeds.

But the glory of the landscape is in the snowy masses of the shad-bush bloom, here covering the hillside like a bridal veil, there breaking in white surf against the dark green of the spruces beyond. Already the long white petals are drifting down, and in a few weeks the rich purple berries, the "Indian pears" of boyhood, will be at their best. He who has not tasted shad-berry pie has a new and a most delightful experience awaiting him.



"THE WILSON'S SNIPE AS HE CUTS SWIFT DOWNWARD CURVES
AGAINST THE ROSY WESTERN SKY"

I am interrupted in the joining of my rod by a marvel of bird song. A rollicking joyous song it is that fills the whole valley of the stream, and I imagine a bird at least as large as a robin. But no bird life is at the moment in sight, save that tiny mite in olive feathers fluttering about the top of a tamarack, and surely no such song could come from such a morsel of bird life. But presently it flits out to the tip of a spray and again that torrent of melody breaks forth,—“See, see, see, whew, whew, whew, whew, hipatee, hipatee, hipatee!” Then again it begins an exploration of the tree, and in a moment drops low against a dark background, and I get a momentary glimpse of brilliant red feathers set in the centre of its tiny crown. Then do I know that I have found the ruby-crowned kinglet, Van Dyke’s little king, in his native kingdom. Little larger than a hummingbird, and dressed in sober olive, except for that tell-tale crown of ruby red, no bird of the North in proportion to his size can approach him for the volume and joyful exuberance of his song.

Down among the lower branches his little lady is bustling about intent upon business of her own, and to all appearances annoyingly unmoved by the vocal efforts of her miniature lord.

For the next hour as I wander down stream his song comes to me, fainter and fainter, until it fades into a far-off remnant, “Hipatee, hipatee, hipatee!”

On a small twig of willow near the bank, a mourning-cloak butterfly is behaving in a peculiar manner. She is moving slowly about the twig in a spiral motion, and her dark brown yellow-bordered wings, though closed tightly together, are vibrating with excitement. Closer examination shows, girdling the twig, a zone of yellow, ribbed eggs; and as Madam Mourning Cloak revolves about it the zone is lengthening. In a few days small, black, spiny caterpillars will be feeding upon the tender willow leaves, and in the early autumn brown chrysalides will be hanging by their tails from nearby supports, and emerging into velvety brown butterflies that will spend the winter in this mature stage.

From under the cover of a low spruce by the side of the path a bit of brown life scuttles away through the blackberry thicket and reappears a short distance off as an anxious white-throated sparrow. A little searching discloses the nest, a deep hollow in the ground lined first with bits of rotten wood and hair-capped moss, and in-

wardly with fine dry grasses. The five bluish-white eggs are marked with fine purple spots thickly clustered around the larger ends.

Here is an opportunity to take a fair census of the bird life in the immediate vicinity; for the sharp, metallic alarm call of the mother white-throat, augmented by a little judicious “cheeping” from my own lips, will bring a good representation of her friends and neighbors. Whether from mere curiosity, a desire to take a wary peek at a common enemy, or a vague hope that combined forces and scoldings will drive him from the field, at any rate, they come.

The first to appear is a junco, spreading to the full his snowy side tail feathers and adding his more pebbly “chip” to the sharper note of Mrs. White-throat. Then a black-and-white warbler slips silently down a tree trunk, gives me a searching look, whisks around his tree to view me from that side, and, deciding that I am harmless, resumes his ceaseless search for insect life along his barky thoroughfares. Three black-throated green warblers are drawn for a moment into the magnetic area, but, more concerned about their avian eternal triangle, they, too, stay but a moment. From a clump of alders a Maryland yellow-throat peers at me through his black robber’s mask and adds his softer note to those of the sparrows. A pair of beautiful little parula warblers comes into the circle but are presently driven off by a male magnolia warbler, who, apparently jealous of their rare beauty, flaunts his gay costume of black, white and rich yellow almost within reach of my hand. Then fluttering downward from above comes a pair of redstarts, their gaudy coloring and delicate butterfly poising seeming ever out of place in our northern woods. A flicker, drawn by the general excitement, perches atop a dead stub, bobs awkwardly and flies off. As my eyes shift to a lower level I am aware of the

presence of a hermit thrush. Silently he has appeared. I look again, and he is gone. But a little way off I hear his measured “pip—pip—pip,” like water dropping into a deep cool well.

And now comes over the spirit of the brook that mysterious spell, sometimes known to all ardent followers of little streams, which precludes the rising of another trout until the afternoon shadows begin to fall across the waters.

The rod is taken down, and I deliberately relax into an attitude receptive to any sight or sound that may be offered. The morning wave of bird song has passed, except for the insistent repetitions of a red-eyed vireo punctuated occasionally by the echoing call of an ovenbird somewhere off among the high hardwoods.

But presently from a ridge of birch saplings comes a low “thump—thump—thump, thump, thump, thump thr-r-r-r,” starting slowly and increasing in velocity until it ends in a low rumble like distant thunder. Somewhere



"I MARVEL AT THE
DELICACY OF THE
INSECT BEFORE ME"

up there in the low growth a cock ruffed grouse is beating out his rolling call.

Now all other sounds are ignored, and when, three minutes later, the measured "thump—thump—thump" begins again I mark its direction in line with that dead fir.

Here is an opportunity to see the ruffed grouse at his best; but I know that his every sense is alert, and if my quest is to be successful my craft must be matched against those sensitive eyes and ears. The latter I can deceive by making my advances only when they are deafened by the muffling rumble of the bird's own efforts. And so by long rigid waits, and swift silent advances, I come within a few feet of the performer.

The very incarnation of that spirit of ceaseless vigilance that still preserves his race against a relentless and senseless persecution, he is strutting to and fro along a moss-covered log. His crown feathers are erect, black neck ruffs fully displayed, and the fan of his tail is spread to the utmost. Each step is taken with an elastic jerk accompanied by a flipping of the broad tail. Presently he stops, looks warily in every direction and straightens his body nearly to an erect position with tail and wing-tips almost touching the mossy log. Suddenly the wings are moved away from the body and brought swiftly inward, the expelled air producing an explosive puff. Again and again, more and more rapidly come those quick inward wing-beats, and the puffs become merged into a rolling whirr. It comes as a surprise that the drumming at close range sounds softer, more cushiony, and less resonant than at a distance.

The performance done, again the bird is all alert, and I know that my least incautious motion will bring forth that warning "pip, pip, pip," that precedes a sly running departure through the underbrush or a sudden whirring flight.

Again and again I am permitted to watch the efforts that are perhaps even now drawing into that charmed circle a shy though willing brown-feathered lady; and, lest my unwelcome presence should interfere with a happy ending to a woodland romance, I retire as silently as I have intruded. Upon reaching the brook I hear again with

satisfaction the drum-roll from the nearby birch ridge.

Where I eat my lunch the brook circles into a little weedy cove; and I sit idly watching the caddice larvae clumsily dragging about their miniature log-cabin cases in the still water below. A small killifish comes scouting in among the water weeds and instantly every larval head is withdrawn within its case and what, a moment before, were lively caddices appear now as lifeless bundles of crisscrossed bits of vegetable matter, inert on the bottom.

Directly beneath my eyes one of these bundles soon becomes unusually agitated. Presently a head appears at its open end followed by thorax and abdomen. The creature leaves its case, rises to the surface of the water, crawls up a stalk of water-weed into the air, and I behold, not the usual, sluggish, grub-like tenant of a caddice case, but a fully developed insect with antennae, six legs and delicate wings.

While I still marvel at the delicacy of the insect before me, the vicissitudes through which the lowly larva has passed beneath last winter's ice, and the marvel of the structural changes that transformed it into this aerial being, a new wonder awaits me. Along the back of the insect a cleft or slit suddenly appears. The creature curves upward, struggles for a few seconds and then there emerges through this slit an insect even more delicate and airy. A cast-off water-proof casing, transparent and rivaling in delicacy the thinnest mica, but perfect in every detail, even to the tips of wings and fine drawn antennae, is left clinging ghost-like to the leaf; and away flies our now perfect caddice fly to meet new dangers, and, if the woodland fates be unusually kind, to fulfill its great destiny of reproduction.

Along the lower course of the brook an occasional speckled trout is laid among the wet sphagnum in my creel, and when my line is finally reeled in, the toads are trilling their dreamy serenade along the edges of

the marsh, and from the upper air comes down the winnowing of the Wilson's snipe as he cuts swift downward curves against the rosy western sky of the spring evening.

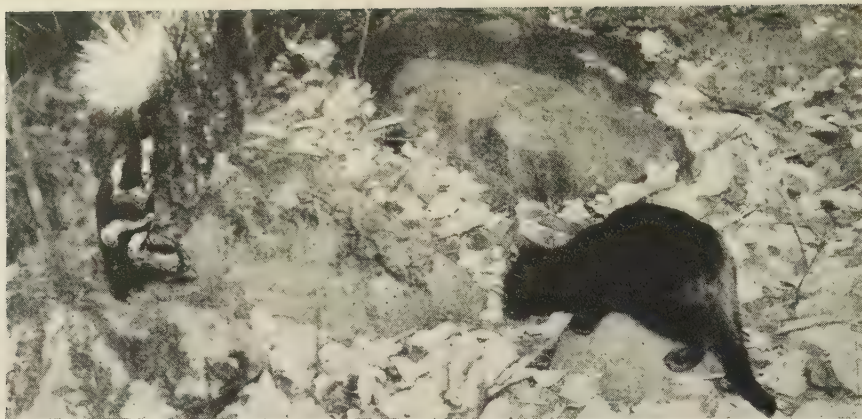


"A MOURNING-CLOAK IS BEHAVING
IN A PECULIAR MANNER"



"VAN DYKE'S LITTLE KING,
IN HIS NATIVE KINGDOM"

The sixth special geographic issue—this time on the Carolinas—will appear in May, and will paint an accurate and lifelike picture of these two interesting states. Herbert Ravenal Sass writes the lead article; Alexander F. Sprunt, Jr., covers the birds; E. T. H. Shaffer, the gorgeous gardens of lowland and mountain slope; W. C. Coker, the rich plant life; Peter Gething, the reptiles and amphibians of swamp and brook, and C. S. and H. H. Brimley, the extraordinary fish life of the region. The forests, mammals, and mountains are subjects handled with brilliance by J. S. Holmes, C. B. Chamberlain and Robert Lindsay Mason respectively. Additional features of the issue will be the cover—a four-color cartoon map by Jex; the full-color frontispiece by R. Bruce Horsfall.



JUST BEFORE THE TRAGEDY HAPPENED

Two pussies face, with *Spilogale* doing a hand-stand before resorting to harsher methods of defense

THE WAYS OF SPILOGALE

BY WILLIAM E. SHERWOOD

FLASHLIGHTS BY THE AUTHOR

SCIENTISTS call him *Spilogale*. Other folks call him the little spotted skunk, striped skunk, civet or civet cat, polecat, sachet kitty or any one of a great variety of names. To be sure he is a skunk though much smaller than his well-known cousin, *Mephitis*, and instead of only two stripes he is handsomely marked with a pattern of several stripes and spots symmetrically arranged.

For several weeks I had the privilege of frequently observing these entertaining little mammals as almost every night—they are strictly nocturnal—they would come singly or in pairs (occasionally as many as four at a time) to partake of the food which I put out for their benefit. Many a time have I been awakened by the stamping of feet, which is one of their methods of expressing excitement, fear or warning. This stamping is extremely loud for so small a creature and, as far as volume of sound is concerned, would do credit to an animal several times larger.

To make definite statements as to the habits or behavior of *Spilogale* would be difficult, for these animals, just like humans, have so much individuality and personality among themselves that their actions can scarcely ever be predicted. Sometimes, for instance, two or more of them would be eating amicably side by side, while other times if one should approach another at his repast there would be violent scolding, threatening or fighting.

The fighting would usually be done in a more or less playful manner, the two of them rolling over and over, nibbling and screaming at each other. Their cry at such times is shrill, high pitched, frequently

repeated and quite decidedly unmusical to the human ear.

Sometimes a greedy one would keep another away from the food by threatening to "spray" him. He would keep his tail raised, and business end continually pointed toward the intruder no matter how much the latter might circle for an opening. Any closer approach would be met with foot-stamping or other threatening gestures. Finally, with appetite satisfied, the selfish one would leave and allow the other to glean what was left.

One of the skunks would eat from my hand with but little hesitation, and once he experimentally nibbled at my finger before taking the food. He was playful as a kitten and got great enjoyment from pawing at a strap which hung from my tripod.

Perhaps the most interesting and surprising trait of *Spilogale* is his "hand-stand", used to terrify his enemies or to express strong emotion. This is done by standing upright on his hands with body vertical and hind legs pointing out at right angles to the body. Needless to say

this performance is so unexpected and so frightfully grotesque that it can be well calculated to put fear into any animal. The attitude itself is harmless as the skunk faces his subject and cannot possibly eject his nauseating fluid in that direction.

In spite of the harmlessness of this performance, however, the skunks often used it successfully to intimidate each other, especially when one wanted to drive another away from the food. In this case it appears to be merely a threatening gesture or an expression of anger, for the skunks themselves would be expected to realize its harmlessness.

Not (Continued on page 267)



A HANDSOME FELLOW

The little spotted skunk has many interesting characteristics



READY TO CALL

He expands his body prior to bursting into melodious voice



WHEN HYL A ANDERSONII SINGS

His little arms push his body away from the blueberry stalk to make room for the full notes of his plaintive love song



ANY RESULTS?

He waits hopefully for a mate before beginning again

PINE BARREN PIXIES

BY RUTH CROSBY NOBLE

ILLUSTRATIONS BY THE AUTHOR

LAKEHURST—the haven of giant dirigibles and the refuge of nerve-fagged humans! Yet to the naturalist, it is primarily a gateway to the Pine Barrens, those wastes of arid sand, treacherous cedar swamps, and stark pine forests which stretch for two thousand square miles in the heart of New Jersey. From the days of the Indians, this expanse has been a "dark forest," shunned by settlers but lauded by hunters and adventurers.

One afternoon in May I descended from the sophistication of the Atlantic City Express into this forest primeval. I was hunting frogs,—not plebeian frogs, but a genuine aristocrat, a dapper green tree-frog named *Hyla andersonii*.

A rough winding foot-path, worn centuries ago by moccasins of deer-skin, led through stretches of pine toward intertwining cedar swamps. The clear air and the pungency of evergreens were exhilarating but there were waves of depression at times, when the silence and the solitude shrieked too madly or when the wind sighed too woefully through the pine needles. Dismal, too, were the charred smoky areas where fires had blotted out whole forests. Lifeless trunks stretched out their bare arms like black skeletons, while a choking dust arose as my feet crunched through the ashes which once had been trees.

Then the soil grew damper. Cedars and deciduous trees appeared and a straggling undergrowth crept beneath the erect pines. In the distance a slow-running stream of coppery hue twinkled among the trees. Forking here and there, backing among the cedars, it soon lost itself in a riotous swamp. Long years ago, sea captains used to fill their casks with this "cedar water" for it remained fresh much longer than the ordinary kind. Sweeping along with the current were diaphanous ribbons of spirogyra, while festoons of Florida moss swung from the branches high overhead.

The path slunk round the edge of the swamp and out into a clearing. A rude cranberry bog lay shrouded beneath a tangle of weeds strewn over with jagged stumps and roots. Human beings had evidently toiled in vain to earn a living here. Yet capricious hyla pixies thrived in this spot as nowhere else,—romping, singing, and feasting from dusk until the break of day. I chose a camp site and laid aside the duffle. I had come determined to watch their midnight frolic through and to extract secrets of their life history.

Night came on very slowly. Impatiently I splashed into a shallow stream and waded along its course. A leopard frog jumped loudly out of my way. A pond frog, taking



CARRYING ON THE LIFE CYCLE

While a lusty toad published the banns but six inches away from the unconscious couple

the hint, "tchuned" a warning to his mates. A marsh hawk swept into view and disappeared as quickly. The bog, reflecting a brilliant sunset, became a crazy-quilt of irregular patches seamed with drainage ditches that flowed like molten metal.

A weird clattering arose in the distance, as if a hundred boys were nailing shingles on a barn. These must be the voices of the carpenter frogs which I knew only by hearsay. I raised my hand lamp and began to pick my way toward them. In the glare of the light the bog was changed into a different world. The maple leaves lost their pinks and greens and turned to gold. Cobwebs soaked with the evening dew shone like necklaces of diamonds. From the velvety blackness of the night, stumps stretched forth long arms as if to bar my way.

Suddenly a volley of mellow quacks arose directly before me. I leaped forward, shattering the shining jewels in my plunge, and there—not two feet away—resting on the top of a dwarfed maple tree, sat the daintiest of all batrachian creatures. He seemed like some tiny elf, liv-

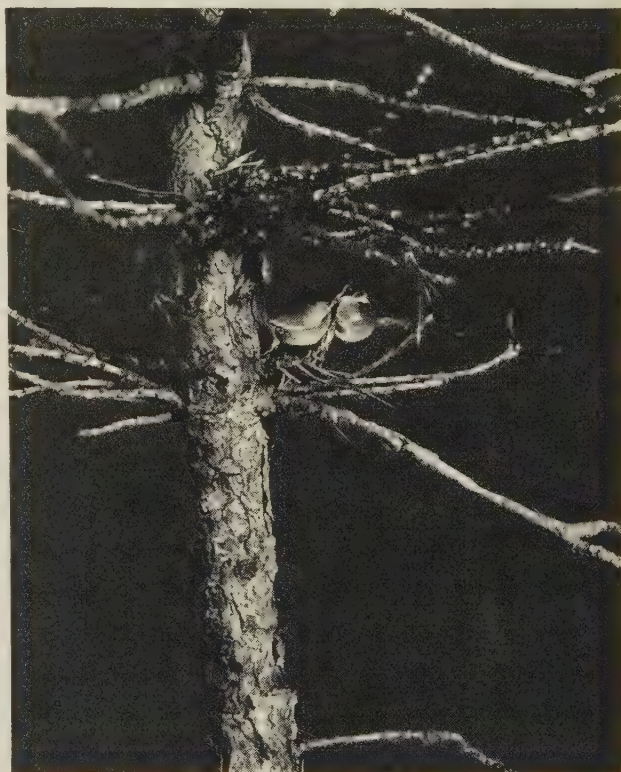


ON THE WAY TO THE STREAM

From the tree he travelled to the water, calling lustily every few hops

eried in green with purple waistcoat and white facings. Wherever his arms and legs relaxed against his body, dabs of golden orange glistened. The king's footman could not have been more faultlessly groomed. It was the pine barren tree frog I had come to find.

His head was turned in an easy manner toward me and his eyes seemed to be meeting mine; but his stare could not penetrate beyond the dazzling circle of the spotlight. Perhaps he was wondering why the moon was shining so much more brightly than usual. Suddenly he blew up his body till it bulged like a toy balloon. With a jerk he forced the air into a pouch which had hung loosely in wrinkles at his throat. The throat was transformed



THE VOICE OF THE BARRENS

The pixie calls from the pine tree, unworried by the human presence

into a giant bubble, stretching from ear to ear. Loud "quanks" echoed across the bog, at first sonorous, nasal; then more vigorous and shrill, but always plaintively harmonious. As suddenly the cry ceased; silence—painful silence—swept over the bog.

The moment had arrived to draw out the camera and flash-light gun. In order to focus, it would be necessary to place the spotlight within six inches of those sparkling eyes. A charge of flash powder was poured into the gun, the plate adjusted, the lens opened, and I was ready for the singer to perform. But now he seemed a bit nervous. Did he suspect my presence? Impatiently he scratched a mosquito off his nose and shook his head, but he made no attempt to move. At last he regained his confidence and blew out his sides for a song. At the first "quank", I released the trigger; there was a staggering blaze, and

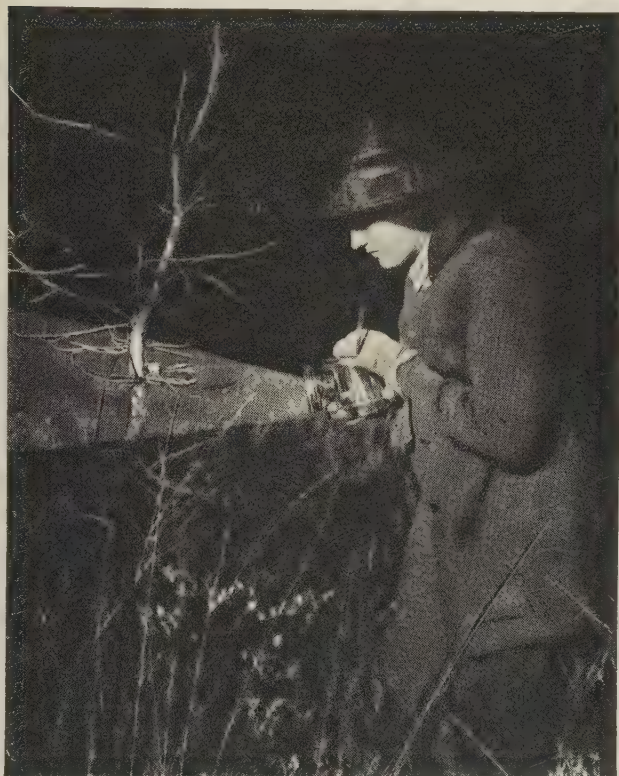
then darkness. It took me some time to regain my own composure. Finally I looked to see what had befallen the little singer. There he sat, as if nothing had happened, while the maple tree swayed in the night breeze. But I could not make him sing again, and turned to other things.

Out in the open at night, one feels but an atom in limitless space and yet suffocated by unseen objects which seem to bear down on every side. My light, penetrating the coppery water of the stream, caught a slow, rolling motion as if a gnarled twig were floating along with the current. Then all was so still that it seemed but the illusion of surface ripples. Suddenly the twig writhed sluggishly into the middle of the brook—a water



SAFE IN THE DAYTIME REFUGE

During the hours of light the tree-frogs bury themselves beneath the Sphagnum



CAUGHT IN THE VERY ACT

The author discovers the gay little fellow joyfully perched in his pine

snake three feet long. He paid no attention to me whatever, but swam calmly along his way. We had much in common, that snake and I. Were we not both hunting frogs? Yet when an unsuspecting leopard frog dove into the water and disappeared into the elastic jaw, my sympathies were entirely with the victim.

Several hours of tramping and splashing brought no further finds. The night had turned too cold. In desperation I returned to camp, pulled a few dry stumps together and lit a feeble fire. Flickering, chimerical images of myself were projected on the heavy fog screen which had settled over the bogs. Great banks of fuzzy whiteness rolled over me as I rested beside the tiny blaze. They were great cold waves, seemingly intent on drenching me, and I clung close to the logs. Now the night creatures saw my fire. A hungry fox yapped in the distance. I pulled my

blanket tighter and sat up, like an Indian chieftain, wide-eyed and open-eared to all that went on about me. As I added another log from the woodpile, a movement along the edge of the fire-light caught my attention. Another movement and there was a friendly hop toad. Had he, too, come here for comfort and company? Alas, no, his fascination for the fire was not so wholesome an instinct. The flame was only a bright attractive thing which urged him forward, right into its very jaws. For a long time he hovered there, keeping me in constant apprehension lest he braze his warty coat. Like many another dunderpate, his fascination for the bright lights would have been his undoing had he not been forcibly rescued. With a stick in hand, I sat there till nearly dawn and shoved him off, a veritable cat playing with a mouse, but with a purpose more humane.

Most of the frog sounds died out in the early morning hours, except those of the carpenters. Their hammering persisted until dawn had fully broken. The sun was well up before the veil of fog was rent into long even shreds



HE CALLS FROM THE GROUND

From the tangle of ferns and sheep laurel rose the harmonious love song

which still hung tenaciously over the flowing ditches, and by the time it was up over the cedar trees, I was hurrying back to the train and civilization, while fence lizards, disturbed in their morning sun-bath, scurried away from me.

Just two weeks later I again visited the Pine Barrens.

How different everything seemed! Leaves were no longer in the bud but had come forth in all their green glory. A dense undergrowth had sprung up so that none of the trails looked familiar. Even the burned area which had seemed so desolate before was now carpeted with ferns and voluptuous pillows of yellow *Hudsonia*. Gorgeous trees of pink and white laurel grew high among the pine trees, while clusters of sheep laurel dangled their rose bells along the path. Blueberry bushes and blackberry vines were in blossom and in some of the more exposed places, the blossoms had dropped off, leaving behind them purplish pink berries of lilliputian size. The spicy aroma of sweet-fern and wild strawberries was added to that of the pines.

To my surprise the cranberry bogs were completely flooded. Sandy dikes stretched like a sturdy frame-work over vast seas of water. As it darkened, the voices of frogs echoed from every bush and bit of flotsam which rose from the water. But the "quank" of the pixies dominated all else. The flooded areas now looked bottomless and without horizon. Yet I braved the depths and when once past the irrigation ditches, found the flood but slightly over my ankles. The old hoptoad was trilling his sweet refrain in several places and once I met a pair mating, spreading their necklace of jet and crystal beads for twenty or thirty feet over the more shallow bog.

Back near the swamp, I finally came upon a patch of cleared ground which was not flooded. Here I discovered my elfin favorite, the little tree-frog which I still recall with genuine affection. He was climbing up a blueberry

bush, like a small boy shinnying up a tree. His delicate hands were curled about the twig and the soft adhesive discs at the tip of each finger made it easy for him to hold on. For fun, I screeched an imitation of his quanks. He started as if a rival were trying to outdo him. His arms became rigid and his whole body was pushed away from

the branch to give his pouch room for expansion. He called as if he would burst the tissues of his throat and body. He sang once and he kept on singing, determined not to be outdone. Was he trying to call for a mate? If so, the frog belles must be adamant not to respond to those earnest pleas. I decided to spend the rest of my evening with this agreeable little chap. I was curious to see what he would do with himself in the next few hours.

Not long afterwards, he hopped down from his perch and took up

his song anew in the midst of green ferns and sheep laurel. A tiny ribbon of water was trickling toward a large rain pool in the corner of the field. He made his way to the stream, renewing his song every few hops. I felt sure his call would not be unanswered. Just then, from out of the weeds close by, another frog appeared; came with a skip and a jump. This one was larger and had a lighter throat. It did not sing. It was a female. She advanced a short distance, then stopped and looked about. Only three feet remained between them and oh, how earnestly he was calling! Not far away other suitors were pleading, too, but none, it seemed, so fervently as he. Perhaps my ears were ill attuned to frog lyrics; perhaps a distant voice brought an unknown sweetness to her

ear. She did not continue the course which she had started. Instead, she turned toward the rain pool and hopped straight into the arms of another mate. My friend was jilted yet he did not seem discouraged. His song continued. There were other frogs in the pond and it is every woman's right to change her mind.

As for the newly-united (Continued on page 266)



IN THE SPOTLIGHT

Gorgeous beyond description
was hyla that night



AN ELF LIVERIED IN GREEN

Clothed with purple waistcoat and white facings,
with golden orange on arms and
legs, he was a beauty

A SAGA OF TIMBERLINE

BY EDGAR C. McMECHEN

PHOTOGRAPHS BY REV. CYRUS E. ALBERTSON

THEY came breezing along at about fifty an hour, and came to a stop with a great screeching of brakes. A nice looking couple stepped from the car, young man and pretty girl . . . spending their honeymoon in the Rocky Mountain National Park, so they said. Each was dressed in what we old trail-hounds call a "natty costume"—if you get what I mean.

"Fine day," said the Man, sociably. "Wonderful weather."

"Well," thought I, "that's obvious." Clear, blue sky overhead; crystal air, with the blue haze of a perfect Colorado autumn veiling the high peaks. I nodded—to encourage them.

"Sublime scenery," said the Girl. She was not the kind to remark, "Ain't Nature grand?" But she did add: "I've always wanted to do this sort of thing . . . enjoy the birds and flowers and trees . . . take a close-up of Nature."

"Yes," I said. "I've just been sitting here admiring that perfect tree, myself . . . the one the pigmy nuthatch is playing around. Clever little trapeze artist, is he not?"

Both of them exclaimed: "That what?"

"Pigmy nuthatch. There he goes now. See him light upside-down on the trunk?"

"Oh!" said the Girl. "Isn't he cunning?"

"Ripping," said the Man. "That's one for Ripley."

"The spruce," I resumed, "is not quite perfect. There's one little jog in the trunk. Probably was a hard winter when that occurred, and the wind tried to beat it down. But when warm weather came the tree started bravely up again. I like to think that the man who built that old, deserted cabin at its base was like that. See how he placed the door where he would see the tree the first thing every morning. Per-

haps he built it during a hard winter, too, but I'll wager he grew straight again. A man who built a cabin with that outlook would."

"That's a nice thought," said the Girl. "Tell us some more about trees." But I could tell that the Man thought I was a little balmy by the way he looked at me.

"That's hard to do," I said . . . "unless I could give you a calling card upon some trees that I know. They grow on the Mummy Range. You follow up West Creek to the top of the rim, where . . . By the way," I interrupted myself, "did you ever see 'The Battle at Timberline'?"

"No," said the Girl. "Who's playing in it?"

"Well—there's quite a cast . . . cedars and limberpine and Engelmann spruce."

"Oh," said the Man, "he's still talking about trees. I thought at first that the sheriff had been chasing some bootleggers." And both of them looked at me curiously this time.

"There are some mighty interesting old warriors at timberline . . . the advance guard. They may seem a little bent and weary and old to you, but you must remember that they have been on the firing line a good many years . . . some of them hundreds, perhaps thousands of years. It takes a courageous heart to stand up before a sixty or seventy mile-an-hour wind, and say: 'I'm here to stay, old top . . . so do your worst!'"

"I see," said the Girl. "That's beautiful. I'd like to see that."

"Ripping," said the Man. "Say—old man—it's asking a lot, I know, but would you mind walking up with us and showing us some of these tree friends of yours? Somehow, I'd like to be properly introduced."

We took the trail up the east rim, and I found myself warming



THE PERFECT TREE

"The spruce . . . is not quite perfect. There's one little jog in the trunk. Probably was a hard winter when that occurred."



THE E PINE ETCHED AGAINST THE SKY

"Can you guess why I call him The E Pine?"

"Endeavor," said the Girl, promptly.

"Endeavor . . . and carry on."

to them after I had shown them the Battle-Ax Pine.

"That's a western yellow pine," I said, "that elected to grow in a very inauspicious place, as you might say. You see the wind comes down the canyon and it gets the full sweep."

"But see," exclaimed the Girl, "how it keeps trying to grow toward the sunlight, pushing up branches from that limb the wind has driven downward."

"By Jove, it does look like a battle-ax at that," said the Man.

The trail grew steep and I could hear them gasping for breath, but neither complained. I stopped to let them catch their second wind, just where the P Pine is silhouetted against the sky, high against a great bank.

THE FRAME THAT CAPTURED THE PEAK

"Through a paralleled arrangement . . . Hague's Peak reared rugged and grim, like a painting seen in a shop window."



THE P PINE FACES THE WIND

"It's not one of the shock-troops . . . just an ordinary doughboy in the ranks . . . but he's doing the best he can."





THE COILED LIMBER PINE

"'Oh, well,' said the Pine, for it was a very tiny tree, 'if I can't go up I'll go sideways, for somewhere I must go.'"

"I call that the P Pine," I said. "Another western yellow . . . we will not have them with us much longer. It's not one of the shock-troops, you see . . . just an ordinary doughboy in the ranks, like you and me, but he's doing the best he can. The wind battered him to his knees, but he wouldn't quit . . . not he. Although badly wounded, he kept right on growing, even when upside down.

"'I will not surrender,' he defied the Wind. 'I will persist.' So he grew into a letter P . . . for Persistence."

"Splendid," said the Girl. "I love that tree."

Soon we reached the canyon rim. Far to the East, the plains were visible, shimmering in the autumn haze like a green-gold sea. Boldly flung against this glowing background was the scrawling E Pine, eloquent of the storms.

THE INSPIRING PINE

"See how he throws out his naked chest in the face of the prevailing wind and of the spears of ice and snow hurled at him."



THE BATTLE-AX PINE

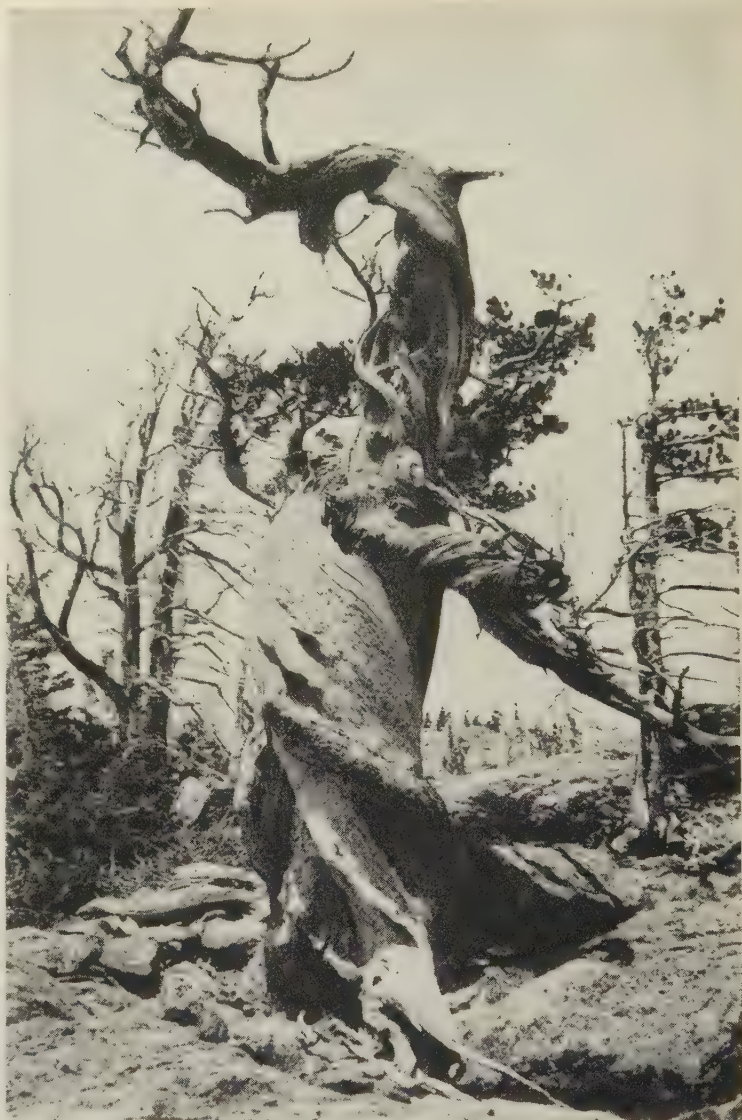
"That's a western yellow pine . . . that elected to grow in a very inauspicious place, as you might say."

"It's a hard life there," I said. "He really should not have tempted fate that way. You see, he's a misfit, cast by chance in the wrong place. This is a little high for him. He ought to be back in line where the firing is not so heavy, and here he is on sharp-shooter duty. Can you guess why I call him the E Pine?"

"Endeavor," said the Girl, promptly. "Endeavor . . . and carry on."

You know, I really began to like that girl then . . . she could play the game. She did not complain when we struck a snow-field farther up the ridge, but plowed along, exclaiming in delight whenever she saw the sun-limned snow kiss the horizon. I stopped them in the middle of this snow-patch.

"That," said I, pointing—but I really need not have done so, for no one could have passed it without admiring—"is the last western yellow you will see, and he certainly has made a mistake in altitude. He didn't climb very high . . . only about three feet. The wind swooped down upon him, battered and tore and tugged at his branches. But in spite of this he has struggled bravely on . . . some hundred years, I should say. See how he throws out his naked chest in the face of the



THE PATRIARCH IN HIS GRANDEUR

"The Wind must have waltzed with him. See how he's twisted—like a rope."



THE TIMBERLINE TRINITY

"Dropped in favorable soil, the seed mother had sent up three sturdy trunks, confident that in unity there is strength."

prevailing wind, and of the spears of ice and snow hurled at him. So here he is, still alive, still green and verdant on one side at least. I like to call him the Inspiring Pine."

"Crackety!" said the Man. "I could lick a barrel of wildcats right now. A fellow won't mind a few hard knocks and bumps after seeing that."

The snow field fell behind as we climbed steadily into the realm of spruce and cedar. The afternoon was waning, and old-gold light gilded the tree trunks; on the far hills purple turned to amethyst. I calculated the next stop with care, pausing just where another of those skyline silhouettes wrote an intriguing scroll against the robin's-egg blue sky.

"There!" I exclaimed, dramatically, "is what *I* call a pine." Sometime or other a seed had blown over a jutting rock. It rolled over the top and tumbled into a tiny crevice. There it came to rest, gradually took root in a handful of moist humus. These roots had penetrated the crack, some crawling up, some crawling down. The roots had

expanded, widening the crack; frost had taken a hand and spread the breach; the roots had swelled again, and so it had gone.

"At first," said I, "this little pine tried to rise in the world, for that is the common impulse of all life, but the Wind roared in anger.

" 'Stay down!' commanded the Wind, and blew its icy breath upon the tree.

" 'I won't stay down,' piped the little pine. The Wind pounced upon it, and shook it, and roughed it, and tore it this way and that. Year after year, the Wind came out of the Northland, sometimes howling with demon laughter, sometimes stealing suddenly upon the tree unawares, as though to take it by surprise, never forgetting its rage, never relenting.

" 'Oh, well,' said the Pine, for it was a very tiny tree, 'if I can't go up I'll go sideways, for somewhere I *must* go.' So he grew straight out. No—*not* straight—for you see he is twisted and gnarled and contorted; but he grew, and grew, and triumphed despite all the cruel quirks life had given him."

"Brave little Pine," said the Girl. "I'll-remember you . . . always."

We were at timberline at last. A ground mat of dwarfed trees rose two or three feet, so densely interwoven that one could walk upon their tops in places. There was the Timberline Trinity, three giant limber pines that sprang from one root. Dropped in favorable soil, the seed mother had sent up three sturdy trunks, confident that in unity there is strength.

"How beautiful!" said the Girl, suddenly, and stopped. "I should call that 'The Frame.' " Long ago a fire had swept this spot. Around us was an area of dead trees. Countless winters had stripped bark from trunks and limbs, leaving forests of vanquished monarchs, blackened by fire in places, or tinted with that peculiar ashen hue of wood, long exposed to weather. Through a paralleled

arrangement of trunks and branches, Hague's Peak reared, rugged and grim, like a painting in a shop window.

"Here's the granddaddy of all timberline trees," shouted the Man. "Would you look at that! The Wind must have waltzed with him. See how he's twisted—like a rope."

The great limber pine, enormously thick in body, in truth, seemed to have been whirled in the arms of Death.

The grain ran round the tree in spirals; even the limbs had this twist, but he was putting up a glorious battle. One solitary branch still carried its plume of needles proudly, but the remainder, both trunk and limbs, were gray with antiquity and suffering . . . the familiar bone-ash color except where the pale, amber sunlight touched it, and then the wood was silvered, as the hoary locks of an aged man.

"Yes," said I, "that's an old friend—the Patriarch." As we passed the Man drew a hand-ax from its scabbard and struck the trunk. It rang, clear and loud, like metal.

"No wonder he has lived so long," said the Man. "He has iron in his soul."

The North Wind had swept over the crest of the Divide, and now came roaring down upon us, his breath chilled by the high snows. With a malicious wrench he staggered and buffeted us, and the Girl would have fallen had not the Man supported her with his arm. We struggled on.

"One more tree," I gasped, "and then we must turn back.

It proclaims faith and victory." Suddenly, as we rounded a rocky promontory, the Harp was etched against the sky, its branches flung behind in one grand sweep, like a wing. One side was perfectly bare. From the other, compressed within a plane hardly wider than the trunk, streamed out a perfect and complete set of branches. The tree, muting the shrieks of the Wind, strummed a paean of triumph.

"And what," said the Girl, softly, "do you call that tree, Mr. Man?"

I said, simply: "The Harp of God."



THE HARP OF GOD

"The Harp was etched against the sky, its branches flung behind in one grand sweep, like a wing. The tree, muting the shrieks of the Wind, bravely strummed a paean of triumph."

EYES OF

THEY HAVE A MESSAGE
FOR THOSE WHO CAN READ

EYES of the wild—what a story they tell! The great pleading, liquid eyes of a deer; the small, fearless eyes of a weasel; the fearless, tricky, insolent eyes of all cats—the whole history of their kind is written in their glances. Just as the human optic reveals character and breeding to those who can read it, so in the realm of the untamed, clear messages pregnant with meaning shine forth from the sight organs of all wild folk.

We captured a pack-rat high in the Rockies after he



INQUISITIVE, ALERT

And perhaps dishonest. That is the story the eyes of the gray squirrel tell

in the woods and turned him loose?

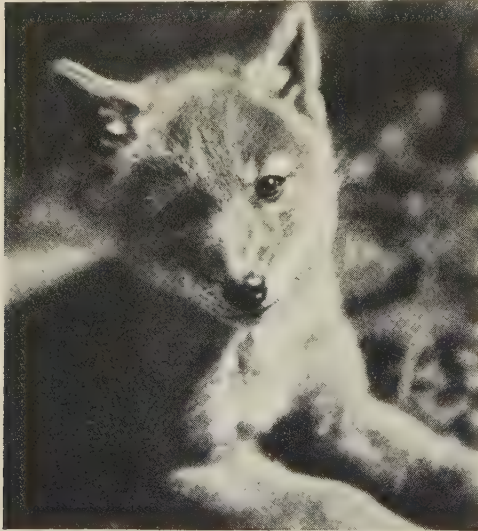
A squirrel chanced to pick up a crumb of bread within range of the lens, and without knowing it, wrote a sketch of his life in the negative. We see that he is alert, and inquisitive, that he may be just a wee bit dis-

THE WILD

BY HUGH STERLING DAVIS

PHOTOGRAPHS BY THE AUTHOR

caught by a relentless foe—crept into his brown eyes. The keeper saw that look, and understood. After all, the pack-rat was only filling his pantry with sweets for the winter. And who knows but that the camera man took him away



A COYOTE YOUNGSTER

Thoughtfulness and a little wonder shine from his brown eyes. Just what is the man up to?

had severely depleted our candy store. We tried him with what we thought was a jury of his peers. And no advocate learned in law and trained to eloquence could have pleaded his case as well as his bright, inquisitive eyes. They spoke long and feelingly of his essential honesty; they wrung the hearts of the jury with their accusation that we, not he, had been the invader and aggressor, tramping in to disturb his home. They explained with charming simplicity that the prisoner at the bar did not know the difference between *meum* and *teum*; but since they could not guarantee that he would not be back the next night, the verdict was guilty, the penalty, death. Before the execution, the condemned was turned over to the camera man for a few photographs.

Many pictures were taken of him. And as the last was snapped, fear—the dread, horror-stricken fear of those



THE DEEP THINKER

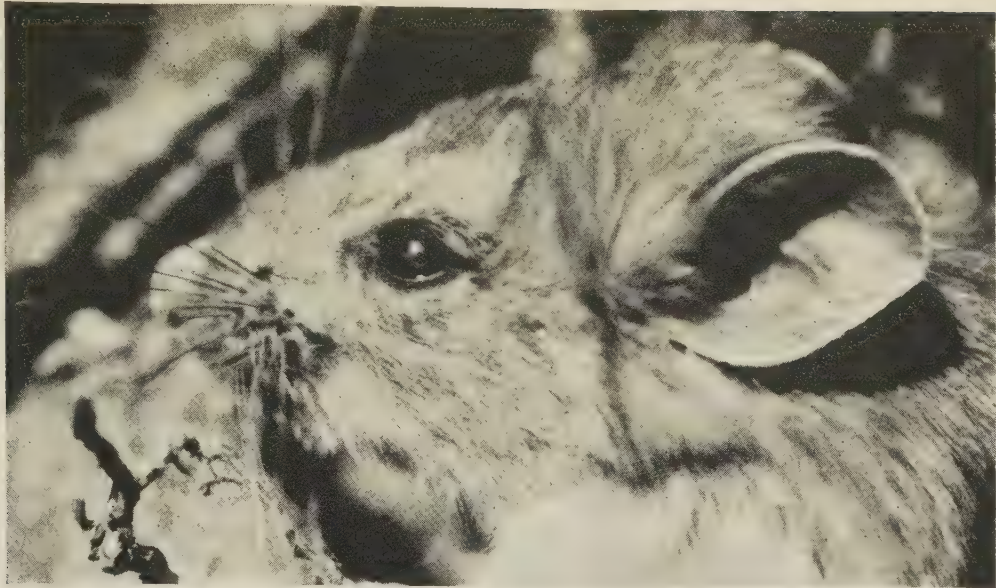
Lofly cerebation and intelligence are revealed by the raccoon's penetrating gaze

honest. Probably he was just on his way to find some picnicker's lunch box.

The mouse has fear, theft, and alertness written in its eyes, while the stupid porcupine showed no sense of danger at all as he tried to retreat over the rocks. Porky has not much need to fear, anyhow, and need not be alert. This old fellow was trying to figure out what I was trying to do, or dreaming of some great spruce tree where he could find a meal of tender bark.

Keen eyesight is not in demand by the "quill-pig", therefore its eyes are small and weak and do not have the sparkle of life that a keen-sighted animal has.

The sly coyote is only a cute little puppy when it is small, but a high-classed outlaw when grown. This little fellow seems to be dreaming of the times he had with his brothers and sisters, before those two-legged creatures



WE WHO ARE ABOUT TO DIE SALUTE YOU

Most eloquent defense counsel were the two brown orbs pleading so hard that no offense was intended

carried him off and tried to civilize him.
One morning I went the rounds of some coyote sets, high up in the mountains of Colorado. One of the sets was gone! The animal had left a trail as he dragged the two traps and clog down through a thick aspen grove, across a clearing, then into a mass of down timber. There I found him; slinking, cowering; trying to blend himself into the whitish gray shadows of the dead "quaker logs".
Not once did this sly creature of the dog tribe snap at me, or growl, or in



CAUGHT IN THE ACT!

And Packy's eyes show he knows it

any way try to bluff. Continually, as I tied his legs together, he watched to discover what I was doing and what I was going to do, hoping perhaps that I would release those iron jaws from his throbbing swollen foot. Always with eyes of pleading turned to my eyes. I worked hastily, trying not to read the message. But all in vain! What had he done to me? After all, wasn't he a friend of mine? How I would have loved to spend a time with him in his native state. I tied a handkerchief around his jaws and toted him back to



SMALL, PIGGISH, GREEDY ORBS

And rather stupid in expression. They show that the porcupine hardly fears at all



THE OPOSSUM'S BLACK EYES

They are compelling and courageous, yet wise. No lack of intelligence here!

camp, feeling a good deal ashamed.

Way high up in a crevice of a great rock I came upon two feathered folk. They met me with a hiss as they reared upright in a fighting pose. Their great round eyes shone as fearlessly as those of a striking snake. There was liberty, wild uncontrolled storms of the air, the free fearless love of God's great open spaces. All written in the brown eyes of two red-tailed hawks.

The gaze of the raccoon is penetrating and deep, suggestive of deep cerebration. The small, beady dark eyes of the opossum are made for night work, and show no fear, but rather self-confidence. Although the opossum may leave the impression of a stupid, lazy animal in the day time, at night this animal blossoms forth like a bursting flower. Its small narrow-set eyes blaze in the dark like two tiny lamps, piercing the dark blanket, seeking the trails of the woods for food.

It may be said that all of our night prowlers have two sets of eyes, anyway, as far as they appear to us, dif-



PLEADING EYES

"What did I ever do to you?" ask the brown orbs of the trapped coyote



GREAT FEARLESS EYES

Revealing the red-tailed hawk heritage of freedom and wildness

ferent in the daylight than they are at night. Some "night eyes" are piercing in their stare, glowing red like a coal from a fire, others are beautiful with soft yellow reflections, while yet others are green like an emerald. What a world of treasures for the one who can understand are hidden behind the "night eyes". It makes a person wish for such eyes, to use on trial, so the wonders and mysteries of the deep woods at night may be better solved.

Characters play a leading part in the histories of man. Thus it is all through the bird and animal kingdom—even the snakes and amphibians reveal their characteristics in their eyes. Whether a creature is thieving, cunning, harmless or dangerous, he will warn you of his nature with his orbs.

To learn to read the messages in the wild eyes found in the out-of-doors is to gain a powerful lever with which to pry from Nature her secrets. The eyes of the wild are the tongues that speak to man, and the language is not difficult to understand.

A FLICKER HOME

IN LATE April a pair of flickers, freshly arrived on the south wind, visited our garden in Pilot Mound, Manitoba, and endeavored to use an old rustic bird house far too small for their purpose. We tried to help them out by bringing from a nearby forest a semi-decayed poplar log, about eight inches in diameter, from which we sawed a piece about four feet long. There was a small hole started in this section either by woodpeckers or some animal, and when we wired the improvised bird house to a dead maple stump, we faced the hole toward the dining room windows.

The next day there was great



ONLY A MOTHER CAN CONSOLE

The young flicker plaintively demands maternal care from the edge of his log home

BY J. HAYWARD

commotion around the stump. The flickers were in action. Taking turns, they drilled and drilled—it took them three weeks to finish the cavity. Most interesting was it to watch them clean out the debris after drilling for a time; they would bring it to the mouth of the hole and give it a decided fling over the lawn. Finally the work was done, however, and the young were raised safely.

The same birds were back this spring, evidently impressed with the type of home that was arranged for them. And their young, too, seemed happily and comfortably housed in the log.



HOW TO MAKE YOUR FISHES LIKE YOU

FRIENDLY ADVICE ON KEEPING YOUR LIVING ROOM GAY

BY CLARA CUTLER CHAPIN

ILLUSTRATED BY JEX

A WASHINGTON housewife, not long ago, happened into her living room to find her maid industriously scrubbing out the goldfish tank. Not seeing the fish, she inquired for them, and the girl, without ceasing her work, nodded toward the sideboard. The lady screamed. There were the fish, all right—each one carefully wedged, head down, in a slender iced-tea glass! After the pets, still alive, were back in their tank and the excitement had died down, the girl explained, "You see, mam, I was afeared they would get away. I didn't think they'd mind for jest a minute."

Goldfish, and other aquarium fishes, are touchy, however, about certain types of treatment, and show their displeasure by promptly dying. They do not demand too much care—in fact, so little is the trouble of keeping them compared to the satisfaction they give that they are almost ideal pets. They do not leave mud tracks on the floors or lead to hard words with the neighbors. They never ask for a walk at bedtime or insist on putting their paws on the family roast. Yet they are friendly in a way that satisfies that craving for personal recognition so deep a part of all of us, and require just enough intelligent handling to appeal to those who like mental stimulus freed from boresome routine with their hobbies. In many ways the brilliance they add to a living room is but a sidelight of the fun they offer.

If the fish should ever issue a Bill of Rights, the first plank would be, "We demand a tank, and not a bowl." Globes are good to look at, but not to live in. The fish need a rectangular shallow aquarium so they will not be exposed to the sudden heat of focussed sunlight, and even more to give them all the air they need. This supply is dependent on the surface area of the water, which must be large in proportion to the

volume. The ideal tank has a slate bottom with plate glass sides supported in a metal or concrete frame. The best of glass permits watching the little swimmers showing off their tricks against the light. A good small aquarium about eighteen inches long and a foot deep and wide will hold about ten gallons of water, and give comfortable accommodation to eight or ten pairs of the smaller tropical fishes. If one is limited in space, an all-glass tank holding about two gallons will serve.

Cleanliness is as imperative to fish life as it is to human welfare, and the gay bits of color that decorate the home ask for a spotless tank and immaculate sand. The first requirement may be met by washing the aquarium with whiting and rinsing thoroughly. The sand—or the mixture of sand and gravel—should be cleaned until it can be shaken with water without the least trace of cloudiness appearing in the liquid after it

has settled. One efficacious method is to fill a preserve jar with one-third sand and two-thirds water, then shake hard, and pour off the cloudy water quickly. Perhaps a dozen washings will be made before the desired cleanliness is obtained, but the time is repaid in healthy plants and active fish.

A third tenet the fish would insist upon would be plenty of plants. These supply part of the necessary air and automatically sweeten the aquarium. There is never any odor from the pet's home if green things are growing in profusion. The plants capture the carbon dioxide the fish exhale and give off oxygen they can breathe, and the way to establish the proper equilibrium is to have plenty of them. Fish can stand too many plants but if they are too few the fish will express their disapproval by an early decline.

A few of the floating plants, just because they are so pretty, should be in every aquarium. The fernlike *Azolla*

No Nature hobby strikes deeper or arouses greater enthusiasm than the increasingly popular sport of raising fishes for pets. A large volume of inquiry on this subject has prompted this delightful and complete article on the essentials of aquarium keeping, which we present with the hope that it will make new enthusiasts as well as give older ones the information they desire

or the graceful *Salvinia* with its feathery roots and its broad hairy green leaves that are so purple and smooth on their under sides are excellent. Duckweed is a poor choice because it multiplies too fast and kills off more desirable plants.

These delightful floaters have their place in the well-appointed aquarium, but they do not do the important work of keeping the tank fresh and sweet. The air-makers are the attached plants, the ones that are moored to the sand on the bottom. And of these there should be a goodly number. *Sagittaria* and *Ludwigia* are attached plants that look well and grow well. Another is *Anacharis canadensis*, which requires an occasional pruning and replanting of the long growing tops. *Valisneria spiralis*, or eel-grass, with its long ribbons of leaves that grow straight up from the bottom and float a little on top of the water, is a favorite. The bladder-wort, *Utricularia*, is efficient as an oxygen-producer, but only the smaller species are useful because the plant is carnivorous, and with the larger species there is danger that very young fish may be caught and killed in the bladders of the plant.

Cabomba is ornamental, and goldfish like to eat it; but unless you have many plants of other kinds it is a mistake, because it does not lend much assistance in renewing the air of the aquarium. The fish will offer no thanks to one so careless as to depend on *Cabomba* to keep them in air. One experienced fish raiser whose fishes enjoy the best of health recommends that a beginner stock his first aquarium with *Valisneria* or small *Sagittaria* to the extent of about a dozen plants to each square foot of bottom, and then add a few bunches of *Anacharis*.

The plants need not be distributed evenly. It is better to group them in one corner of the aquarium so they will grow up and out and leave some clear space at the bottom. An easy way is to poke the ends of the plants into the sand and anchor them with a piece of lead; lead is practically insoluble and will not hurt the fishes as some metals might. Little receptacles may be made for them and have the advantage of being removable. A devoted fish grower of my acquaintance keeps his plants in quaint rustic pots of odd shapes. He makes these out of very small flower pots, which he disguises by covering them completely with a mixture of one-third cement and two-thirds clean white sand. He molds this mixture around

the pots in picturesque shapes and then leaves them in a damp place; after two days he sprinkles them with dry white sand and fills them half full of aquarium sand for the plants. These attractive holders do not hurt the fishes because he is always careful to soak them thoroughly before he puts them in the tank.

With clean sand, rain water and well-chosen plants, your aquarium is ready for its tenants. It goes without saying that these should not be placed in the tank as soon

as they arrive at the house because fishes like being poured from warm water into cold or from cold into warm just about as much as humans would. A simple way of allowing them to adjust themselves is to leave the pail or pitcher in which they came from their native brook or pond beside the aquarium for about twenty-four hours. During that time the water in both pail and tank will be slowly reaching room temperature, and the fishes, when gently poured into their new home, will be comfortable at once.

What kind of fishes to have—goldfish or guppy, swordtail or sailfin? Goldfish are the first considered, because they have been kept in home aquaria longer than any other kind. Today they have plenty of competition amid the trop-

ical fishes, which range from the expensive to the cheap and from the robust to the delicate.

Consider the guppy, *Lebistes reticulatus*. He is a fish of good constitution, vivacious movement and delightful appearance. Being smaller than goldfish, about twenty of his lively kind can be kept in a ten-gallon tank which would cramp four goldfish of ordinary size. The female is almost two inches long, and she is olive drab in color, but the males, hardly more than half her length, are sparkling little bits of color iridescent with lavenders and purples. They usually have a black spot in front of the tail and another behind the head, and often the dorsal fin and the tail are yellow or edged with yellow, and dotted with black; but no two are alike.

The guppy is one of the live-bearing fishes, whose young are born as tiny fishes, not as eggs. This type is a safer choice for the beginner than the oviparous variety. The young coming from eggs must be fed at first on live food—on *Infusoria* and on the tiny crustacea called *Daphnia* and the little white worms named *Enchytraeidae*. Naturally this makes the diet as complicated in



"THEY ARE IDEAL PETS. THEY DO NOT LEAVE MUD ON THE FLOOR OR ASK FOR WALKS AT BEDTIME"

administration as in orthography. The young of the live-bearing fishes, on the other hand, are quite contented with the prepared fish food which can be bought so easily and cheaply at any aquarium or pet store.

The swordtail, *Xiphophorus helleri*, is another good live-bearing fish. He is a cousin to the guppy, but he grows to be a trifle larger. A gaudy-colored creature, striped in red or green, with a bright red line down the length of him, he adds plenty of color. When the male is mature his tail grows to be almost as long as his body, and is narrow and sharp like a sword. It is a bright-colored weapon, usually edged with yellow and sometimes striped with red.

The sailfin, *Mollienisia latipinna*, is distinguished by an odd-shaped fin, which in the male is fashioned a little like a sail. When he is greatly excited that dorsal fin rises up and spreads itself like a crest. If you have ever been acquainted with one of those small wooden dolls whose stiff black bobs shoot to the horizontal, then to the perpendicular, when a spring is pressed in the doll's back, you will find its counterpart in a sailfin trying to register emotion.

The black sailfin is an expensive fish, and rather fragile. A pair of night-colored *Mollienisia latipinna* cost about a dollar and a half or more, depending on their size and on the intensity of the black. They are real beauties, however, and their velvety jet coat marks them at once as among the best born of findom. These are about two and a half inches long, and viviparous, like the guppy, the swordtail and all the moonfishes. They are a peaceable lot, too, and quite willing to share their aquarium home with other fish families.

The top minnow, *Gambusia affinis*, is another comely fish whose young do not have to be hatched from eggs. He is black with white spots. Unfortunately he is of bad disposition and must have a whole tank for himself.

If one is in an adventuresome mood, and desires to try egg-laying fishes, there is none more interesting to observe than the Paradise fish. The father in this family is the most diligent parent. As the mother lays the eggs he picks them up in his mouth and deposits them with greatest care in the nursery that he has already provided for them in one corner of the aquarium—a nursery that consists of tiny bubbles of air that he has blown all by himself. After making the collection, he takes up his

position as chief sentry, and nobody, not even the mother, is allowed to come anywhere near those precious eggs. If any fish swims nearer than he thinks is respectful, he warns it away by a well-placed blow of his tail. This affectionate parental solicitude, however, is not of lifelong duration. As an anti-climax to all his tender care the father is quite likely to turn on his offspring the minute they are out of their eggs and gobble them down with gusto. The Paradise fish is a quarrelsome creature, too, and an impossible neighbor. He will worry other kinds of fish placed in a tank with him, and so vigorously drive them away from their food that they will die of starvation.

Taking good care of fishes is chiefly a matter of feeding them wisely and not too often, and making sure that their dining-room is properly cleaned up after each meal. It is not, as was once wrongly believed, a matter of keeping the water changed. If all is going well the water need not be changed as often as once a year. If something is not right, an odor gives fair warning, and a new start must be made.

If the water need be altered, the cause of the trouble must be first removed. Perhaps one of the original fishes has died, or some of the ones born in

the tank have ceased to live. Perhaps the fishes have not eaten all their food and the uneaten fragments are still in the tank, polluting the water. Perhaps it is simply a matter of plants—too much *Cabomba* and not enough of wholesome *Valisneria*. Whatever is the trouble, a remedy must be found before the new water is put in.

A siphon offers the easiest way to empty the tank. A piece of rubber tubing more than twice as long as the depth of the tank and about a quarter of an inch in diameter will serve. A method of starting the siphon working that improves on the usual unhealthy sucking is to place the entire tube under water for a long enough period to allow it to fill completely. Then, with both ends pinched to prevent leakage, the tube is transferred to the aquarium, one end quickly inserted in the water and the other allowed to hang at a lower level directly over the receiving receptacle. The ends are then released and the flow will be immediate and steady until the tank is emptied. If one of the fish swims too near and seems in danger of being sucked up, the flow can be stopped by pinching the lower end of the tube while he is removed.



"CONSTANT TEMPERATURE, VARIETY OF FOOD, CLEANLINESS AFTER MEALS—IT ISN'T MUCH FOR A FISH TO ASK"

This siphon method not only removes the water quickly and without splattering the furniture, but in addition it cleans the fishes' home by suction, just as a vacuum cleaner cleans a rug.

When about two-thirds of the water in the tank is siphoned off, catch the fishes and put them in a bowl or jar of clean water of room temperature. Then draw off the rest of the tank water and put in about a gallon of fresh water. After this has stood in the aquarium an hour or two, siphon it off and fill the aquarium with clean water, leaving it to come to room temperature before returning the pets.

The fishes should be fed only once a day at some regular time, and always in the same part of the tank. A feeding ring, a hollow glass ring which floats on top of the water, is a great help. At feeding time the food is placed on the surface of the water within the ring, and the fish soon learn where to find it promptly. Give them about ten minutes to eat their meal and then take out all that is left.

Some of the feeding rings have a little dish suspended underneath. The dish is slightly larger than the diameter of the ring, so that it catches all the uneaten food as it becomes waterlogged and sinks, and it is then a simple matter to take out the ring and dish and clean it of all food. Without one of these little dishes the uneaten food sinks to the bottom of the aquarium under the feeding spot; but it can be removed by a dip tube.

A dip tube is simply a hollow glass tube four or five inches longer than the depth of the tank. It should be about a quarter of an inch in diameter, with rounded ends. The operation consists of sticking the dip tube vertically in the water, and holding it so that the bottom end completely encloses the crumb that is to be removed. The top end of the tube is then tightly closed with a finger, and up comes the crumb with the water when the tube is lifted, thanks to the vacuum.

Variety in diet is the spice that makes fish lively. Just as human beings do not expand to their best possibilities on a constant diet of bread and meat and potatoes, so fishes fail to thrive on weeks and months of rice wafer feeding. One may buy at small cost a kind of prepared fish food that does have a fairly good variety in itself; it is made of ground shrimp, meal and dried *Daphnia*. For the tropical fishes one can vary this prepared food by giving occasionally some chopped earthworms, some finely minced beef heart, or some raw beef or lamb cut very fine with scissors.

Fly larvae such as are found in mushrooms make a



"THE BRILLIANCE THEY ADD IS BUT A SIDELIGHT TO THE FUN THEY OFFER"

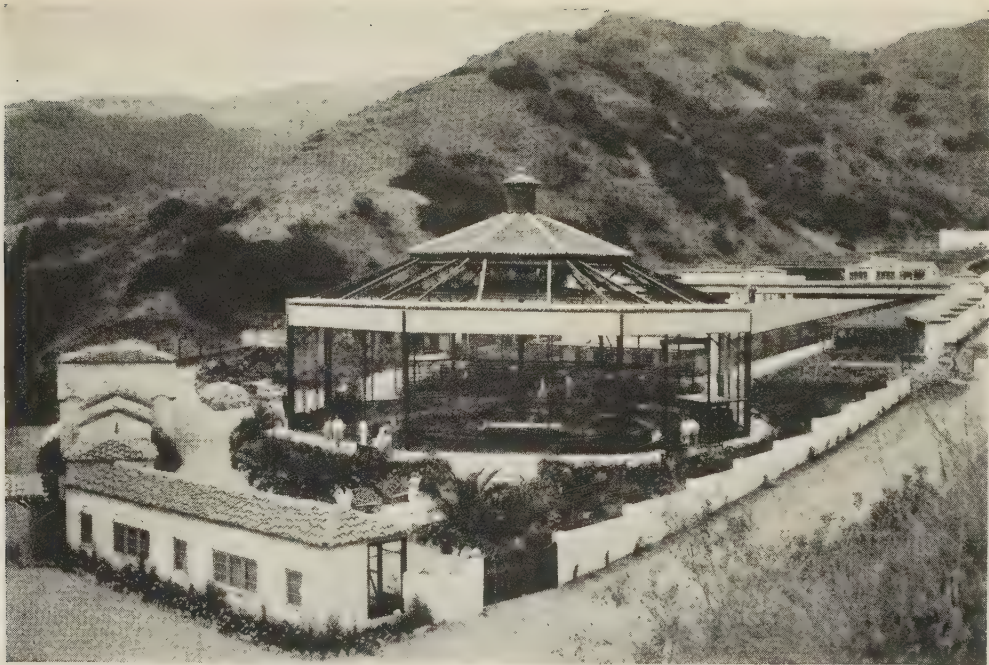
toothsome tidbit. Or you might delight your fishes with some Enchytraeids dug out of sand or mud, or with red gnat larvae to be found in surface water polluted by organic substances. Such food usually exists in quantities in the water from a laundry, tannery or packing plant. Treats of cheese, baked beans, clams, chicken liver, or vegetables, or any fish that is not oily,—all very finely minced, of course,—are quickly gobbled. A few grains of plain boiled rice will look very good to the goldfish. He likes to eat *Cabomba*, too; give him all the *Cabomba* he wants and meanwhile keep the tank well stocked with the other attached plants, the ones which do the work of providing oxygen. The goldfish is of the same family as the carp, and in his native haunts, he eats much vegetable matter as well as many in-

sects and worms and his life may be made gay easily.

Don't make the mistake of offering any of the aquatic insects, or you may find the tables turned and the insects calmly proceeding to eat the fishes. It is wise to examine all the water plants before putting them in the aquarium, lest some of these aquatic insects intrude themselves by the stowaway route. Almost anything else in the food line, animal or vegetable, will be welcome, but don't give the variety at one meal. Give one kind of food one day and another kind the next.

There is one other point on fish care which may or may not have to be considered, depending on the degree of fluctuation in temperature in the room where the aquarium is kept. If there is one thing a fish dislikes above all else it is a sharp change in temperature. Some fishes can survive the hot summers of the South, and some have been known to come safely through a night in which room temperature dropped almost to freezing, but as a safe rule the water in the aquarium ought never to go below fifty degrees or much above seventy-five degrees. The water may be warmed with an expensive tank-heating apparatus sold for this special purpose, or a lighted electric light bulb will do, if held in the water until the temperature reaches seventy degrees.

Constant temperature, variety of food, and tidiness after the daily meal—it doesn't sound arduous, does it? It isn't. Like ever so many other things it is simple as can be when small matters are attended to regularly; only when these trifles are neglected do they exact penalties in the way of extra work. Yet the returns are large; you will have no doubts about that when once your gracefully moving little rainbow-tinted charges have become your friends. Their iridescent forms, gliding through the tank against the sunlight, will be ample reward for giving them the few details of care that their life demands.



THE CATALINA ISLAND BIRD PARK

Which is the creation of William Wrigley, Jr., for his feathered friends

WILLIAM WRIGLEY, JR.—BIRD LOVER

BY LORRAINE WYLER

Presenting the fourth of the series of articles
on Nature hobbies

BIRDS are no respecters of persons, but wisely judge their friends, and with uncanny intuition only bestow their favor on those that truly love them.

When William Wrigley, Jr., pays a visit to his bird farm at Catalina Island, where he has collected strange, exotic, and beautiful birds from all over the world, his favorite pets recognize him as an old crony and joyously trill a welcome. For Mr. Wrigley has loved birds from boyhood—has studied their moods, habits, and characteristics. This boyhood hobby followed him into manhood and his feathered friends proved a relaxation from business problems. When he bought the magic isle of Santa Catalina, rightly called the "Jewel of the Pacific," where unkind winds never blow, snow and frost are



THE GUM MAGNATE AND "RUDY"

The owner of Catalina Island and his Australian cassowary, one of the avian host of pets

unknown, and the rain falls only in gentle showers, Mr. Wrigley immediately decided that this was the perfect place to make his dream of an ideal home for his beloved birds become a reality, and created a genuine garden of Eden for them.

In E. H. Lewis, a taciturn Scotchman whose whole life is centered in the study and care of birds, he found the very man to carry out his ideals. Mr. Lewis is descended from generations of British game-keepers, and has been a bird breeder from boyhood on famous English estates. His quick cautious movements and bright alert eyes remind one of his feathered charges themselves.

Mr. Lewis made it possible in less than one year's time to complete Mr. Wrigley's plans, and his avian paradise was born!

He possesses a bird sanctuary where five thousand rare and lovely birds from all over the world live in their native state, out of doors, with no glass needed to shelter them, and no furnaces to warm them.

In this incomparable bird haven, situated in a lovely green valley between soft rounded pastel tinted hills, dwells every species of bird obtainable, from the humble sparrow to the aristocratic beige-colored Demoiselle cranes from Belgium, which have been favorites with royalty for untold centuries. California mountain quail dwell in happy contentment with coy dove-like Chukkar partridges from India, and sleep side by side with golden pheasants from Manchuria, the tail feathers of which rival those of the Bird of Paradise.

The rare South African stork, which travelled fourteen months from a distant home, regards with interested eye a flock of newly hatched pea fowl, already larger than the tiny Japanese bantam hen which mothered them; a black swan sails by majestically, ignoring the rest.

The trees are colorful with exquisite and expensive rainbow-tinted macaws and cockatoos, parrots, and red, white, blue, golden, copper-hued, and jewel-tinted parquets, which perch in the branches. Love birds by the

score pose on twigs as if they were animated pussy-willows.

The great argus of India, rarest of the widely-scattered pheasant family, is ignored by the white peacock of East India, as he struts and plumes himself as if well aware of the veneration in which his ancestors have been held for centuries. While just across the way in a lordly run befitting his size, "Rudy," an Australian cassowary, as large as an ostrich and weird as a picture out of some prehistoric past, seriously regards the flamboyant group.

There are silver pheasants from Southern China, vulpine-hooded Abyssinian guinea fowl, Chinese Mandarin ducks, Venezuelan guans, and feathered representatives from every land who live together in peaceful, healthful harmony. Each has its own special diet list and the constant watchfulness of men who know and love them.

In the future Mr. Wrigley hopes to breed these rare birds that seldom, if ever, are reared in captivity. He believes all conditions are right and already experiments have met with success. It is said that love can accomplish anything—so in the future his new dream, a place where bird lovers can find the fascination of the whole world of wild fowl in every stage of development, will probably be realized and become a vivid and fascinating reality.

TWO GENERATIONS OF REDWOODS

BY S. J. HOLMES

THIS picture, which was taken in a redwood forest in Del Norte County, California, does not require the deductive powers of a Sherlock Holmes in order to interpret its meaning. Since it represents one redwood tree growing upon another one, the upper tree must have started to grow after the other had fallen. The trunk of the upright tree shows about twenty-five hundred rings, and therefore must be about twenty-five hundred years old. It was a big tree when Demosthenes was delivering his fiery orations in Athens, and was a stripling of some six hundred years at the beginning of the Christian era. Twenty-five centuries ago a redwood seed germinated in the debris and humus which had accumulated upon the trunk of one of its fallen predecessors. As the young tree grew its roots formed a connection with the soil on either side of



the fallen log which may have been partially buried at that time. Recently this log was sawed across, and a count of its annual rings showed its age to be over two thousand years. In all, over forty-five hundred years are represented in these two generations of redwoods.

Most of the prostrate log was sawed up and converted into lumber, a fact which is indicative of the great durability of redwood, at least under the climatic conditions prevailing in northern California. The largest part of the tree, although forty-five hundred years old, was still sound and firm. The photograph shows several plants growing on

the sawed-off surface of the upper tree. Perhaps another redwood may start there, and in another two thousand years develop into a third generation of forest giants. What is human longevity compared to this?



MEETING AN ANT FACE TO FACE

HUGH STEVENS BELL

The microscope aids the camera to reveal the interesting features of the insect—the strong jaws, holding a splinter of wood, the alert antennae, the brilliant eyes and the queer shaped head

MICROSCOPIC MIRACLES

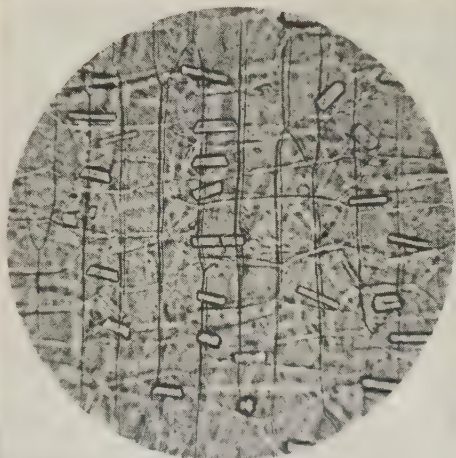
LOOKING AT THE FACTS OF A TINY WORLD

BY ED WOLFF

FOLLOWING PHOTOGRAPHS
BY PHILIP O. GRAVELLE
COURTESY BAUSCH & LOMB

THERE is something supremely fascinating in the observation of minute forms of life. It is one type of entertainment that seems to grow in pleasure as it becomes more familiar and habitual. Summer affords unnumbered opportunities for disclosing real marvels of Nature's intricate adaptations of tiny creatures to their environment. And for a delightful evening during winter's rough weather there are few indoor sports that can compare with viewing preserved specimens under a powerful glass.

The microscope is so startlingly



THE SKIN OF AN ONION

Revealing the tiny crystals that 120 diameters' enlargement brings out

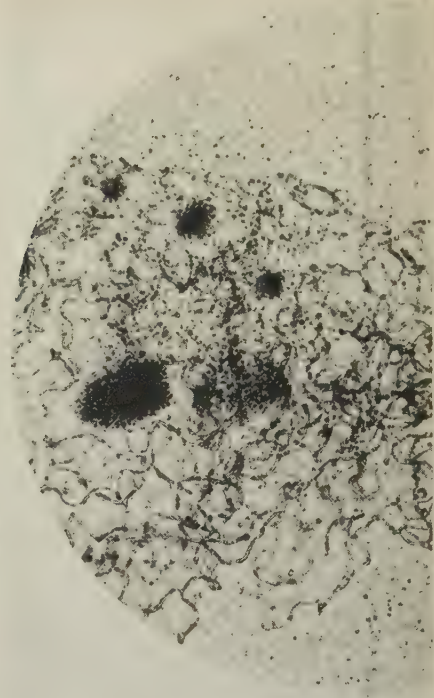
revealing. To the unaided eye the head of an ant appears as a bit of reddish matter, with two thread-like appendages and a couple of dark eye-spots. One could hardly imagine anything more dull or uninteresting. But bring it into focus under a microscope of even moderate power, and what a transformation!

The erstwhile dull bit of matter becomes a reversed pyramid, with its apex pointing downward. And what a glorious pyramid it is, sheathed with gleaming scales of copper that glint and sparkle richly! The eyes, at the top corners of



HAVE YOU EVER SEEN A WHELK?

It is a small mollusk that burrows in the sand and preys on clams. This microphotograph shows its palate



STUDY OF A SLIME MOULD

The capillitium and spores of *Arcyria carnea* magnified 120 diameters

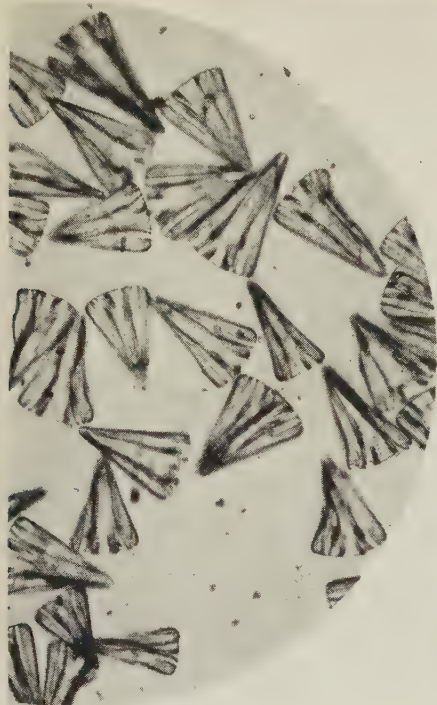


PRESENTING A PROBLEM IN INTRICATE RHYTHMS

The foot of a caterpillar, with its numerous cilia, suggests difficulties of manipulation

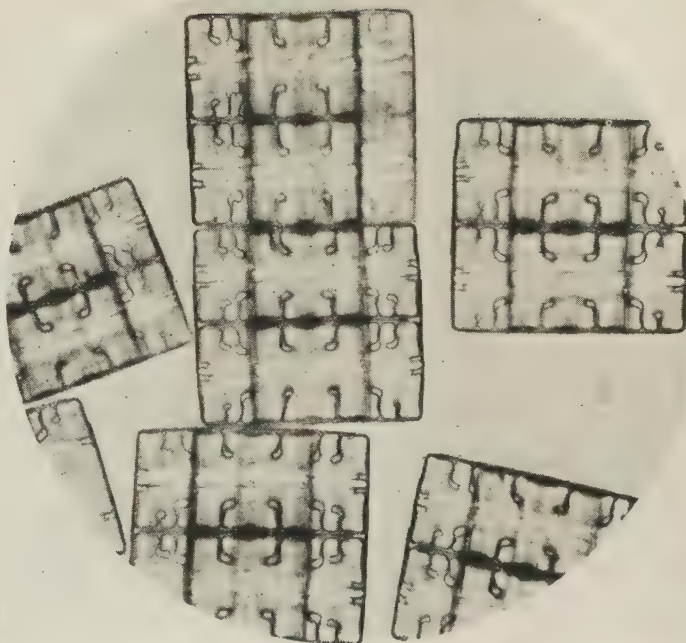
the triangular face, become large, and round, and luminous. There's expression in them—an alert inquiry into what's going on seems to be passing through the insect's mind. A moment ago you might have scoffed at the idea that an ant has a mind; looking at these eyes through a microscope you instinctively accept the belief that, small as its speck of brain must be, the ant has real intelligence—an intelligence apparently so capable that involuntarily you yield to it your admiring respect.

That respect increases rapidly as you inspect the little animal's limited equipment for conveying ideas to and from its brain. It lacks the amazing co-ordination of vocal cords, tongue, teeth and palate which enables us humans to tell each other what we know through articulate speech. It lacks the priceless fingers and thumb with which we can handle objects, learning their shape, softness, roughness, temperature and other qualities. It seems to lack ears and nose.



LIKE PARTIALLY CLOSED FANS

These diatoms, *Licmophora jurgensii*, make fascinating study under a microscope

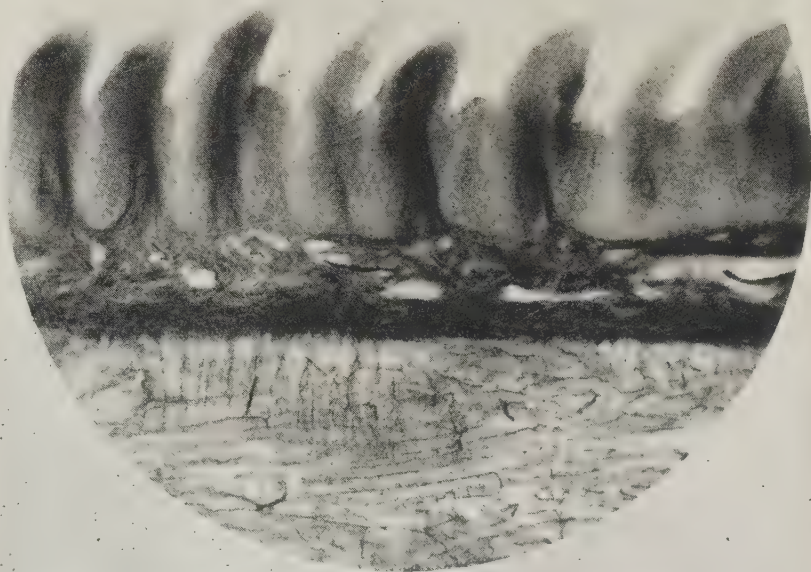


FRESH WATER DIATOMS FROM PORTO RICO

When magnified two hundred and fifty times, these samples of *Terpsinoe musica* look like elaborate griddles

But what are these two growths below its eyes? Thread-like they seemed to the naked eye, yet now they take on design and form—for all the world like a baseball bat, elaborately carved over its whole area. Perhaps half as long again as the face itself, they are affixed to the head at the small end of the bat. For perhaps a half of all their length they extend upwards and outwards; then, with a rather sharp bend, they curve downwards and outwards. The distance between their tips is possibly three times the width of the face; and the tips themselves are shaped like wheat-grains. Ants certainly communicate through touching each other with these mobile sensitive bats (their antennae), as we can plainly see by putting under our microscope the heads of two captive ants. But how? We can watch the process with absorbed attention, but we cannot understand it.

There is more—much, much more—to the ant's head than



THE RASP-LIKE TONGUE OF THE HOUSE TABBY

The cat-lover would never suspect such a saw-edge on the appendage of his pet—yet the microscope tells the truth

has been told here. There are his legs—full subject for another article—his hairy, jointed abdomen, his pinched-in waist, his chest. Yes, this one ant can provide us with instruction, and wonder, and thrilling discoveries for the evenings of a whole week.

Such relatively huge specimens as the ant are not the only objects to be examined. A few blades of dried hay soaked for, say, 24 hours will supply a vast menagerie of curious and surprising forms of otherwise invisible life. A drop of ditch water opens another mystifying world. The wing of a fly becomes a jeweled screen beyond the dreams of Aladdin's genie. To you a rose leaf is only a rose leaf, perhaps; but under the microscope lens it becomes a wondrous structure of engineering—framework, supports, food canals, cells. Oh, the unseen world is so very full of an enormous number of marvels!

In selecting your microscope you'll have to choose between power and field. That is, between great magnification and the area of the object that you can view. You can't have both. To cite an example; suppose you had a microscope that would magnify 200,000 times; and suppose you wanted to see our ant's entire head thus greatly magnified. Why, its apparent diameter would approximate 1,500 feet! Of course no microscope ever made will show an image of any such size as that. It would be comparable to sitting on a post in the middle of an empty

city block and trying to examine an ant's head that covered all that stretch of ground!

A microscope of low or moderate power gives a fairly large field. And the higher the power the smaller the field. Besides, as magnification increases we may lose definition, because the smaller the object viewed the less light it reflects into our eyes. Only a more expensive microscope will yield acceptable illumination in the highest powers, and a cheap instrument of high power is almost certain to give a blurry image glaring with bothersome color fringes.

For most work, fifty magnifications afford thousands of breath-taking surprises. And a very good microscope indeed, with powers ranging from seventy-five to three hundred, may be purchased for as little as eighteen dollars. I should certainly not advise paying less. This particular type of instrument has given me a lot of pleasure. By magnifying an object seventy-five or one hundred times I may view a small object in its entirety; then, by using perhaps two hundred and fifty or three hundred magnifications, I can study certain of its astonishing details by themselves.

Microscope fun is inexpensive. There's no upkeep cost. You can get out your instrument, enjoy it for minutes or hours, and put it away until you want it again. A good microscope fills many an otherwise idle hour, during good or bad weather, yielding instruction, pleasure and wonder.



CUP FEEDING THE YOUNGSTER

Mealtime was best of all
for Johnny

JOHNNY THE WOODCHUCK

HE MADE A FINE PET
—WHILE HE STAYED

BY MRS. J. D. LEWIS

JOHNNY WOODCHUCK arrived in May, protesting against fate; but as soon as we discovered that milk in a teaspoon was what he wanted, life became much better for the little animal. It was not long before he let my twelve-year-old daughter touch him, and by the first of July, he would nibble her fingers, rub his head in her hand or romp around the floor like a kitten. It was funny when he first learned to whistle, nearly driving the dog frantic; but the pup soon learned that this woodchuck was not to be touched. Several times he gnawed out of his box, but always came to the house, where he ruled as favorite again.

Buttered bread was a great treat to him, and he always sat up holding it in his paws to eat. Clover, dandelions, cabbage leaves and apples, with half a cup of milk night and morning, formed his diet, and by the last of September he was rolling in fat.

October, however, brought desires of the outdoors. He gnawed out of his box and dug himself in under the middle of the woodshed, where he chattered and scolded, seeming to say—"Let me show you how a woodchuck should be housed for the winter." So there he stayed, as he should.



VERY CONTENTED

Nor could he be blamed, with such
an attractive miss with
whom to play

"THEY TOIL NOT, NEITHER DO THEY SPIN, . . ."

BUT THOSE WHO GROW THE LILIES MUST DO BOTH

BY ROMAINE B. WARE

ILLUSTRATIONS, UNLESS OTHERWISE CREDITED, BY J. HORACE MCFARLAND

THERE is probably no phase of gardening more filled with the blessing of adventure than the growing of lilies. Of course any type of gardening is an adventure; each planting of an unknown seed is a plunging into a new cosmos. Every gardener is gambling against odds with the elements, pests and blight. But the growing of lilies easily becomes the greatest adventure of all. The lazy gardener had best forego these beauties if he is unwilling to study them intensively. There are varieties of flowers which will thrive under almost any conditions and even in spite of neglect, but not so with lilies. They are truly fastidious in their tastes, but when their needs are understood and their definite wants supplied they lavish a measure of beauty equalled by few other flowers.

Lilies are the royalty of the garden; their stately carriage, their chaste elegance, the exquisite perfection of their every detail place them above even the aristocracy. We will grant that the rose, "Queen of Flowers," holds sway by the perfection of her charms and her universal popularity, but the lily adds a gracious air of majesty not supplied by any other member of the floral kingdom.

Although our knowledge of lilies and their culture is today vastly greater than it was a



EXQUISITE PERFECTION

The native *Pardonium* either in bud or fully opened flower has infinite charm

few decades ago, comparatively few amateurs enjoy these beautiful blooms. There are a few exceptions, of course—The Madonna, for instance, might almost be classed as "popular", and this in spite of the fact that it is by great odds not the easiest variety to grow. Other lilies such as the Tiger are grown so easily they are almost considered weeds in some gardens. Here and there amateurs are experimenting successfully with various new types. But as a rule, few gardeners today know more than a fraction of the large number of lilies.

A gradual awakening to the possibilities of the lily has been slowly coming about since the discovery of the Regal lily in 1903. In August of that year, the late Dr. Ernest H. Wilson, world famous plant hunter, found this wonderful plant in a far away mountain valley of western China. Here it grew by the thousands, lavishing its beauty and delightful fragrance upon the lonely mountain side. In his attempt to secure it Dr. Wilson suffered a broken leg and a long illness that nearly cost him his life; but in spite of difficulties, he stuck to the job and the following year sent several hundred bulbs to England, where they bloomed nicely. It was not till 1910, however, that he successfully introduced them to this country. Since that time they have

been grown by the million and the Regal lily is fast becoming the most important lily in American gardens. The western world is deeply indebted to Ernest Henry Wilson for the wealth of plant material resulting from his several explorations, and those who had the privilege of his acquaintance, who were familiar with the far reaching extent of his activities in the horticultural world, revere his memory as one of the greatest if not the greatest plantsman the world has produced; but if he had introduced only this one species, his reputation as a plant hunter would stand supreme.

Lilies are a very distinct group among our garden flowers. They are found growing wild in many parts of the Northern Hemisphere, but strange to relate, no species have been discovered native south of the equator, though they are now being successfully grown in South Africa and New Zealand. America is the homeland of some twenty-six species, Europe nine and Asia forty-six, a total of eighty-one species in all. Some species have several varieties; one dealer lists five kinds of *L. auratum*. The different species vary greatly in their growth, especially in height; the



THE LILY OF ANTIQUITY AND EARLY FAME

One of the most popular, the Madonna lily, is being grown by the thousands today



DR. WILSON'S BED OF LILIUM REGALE

ROMAINE B. WARE

As if in recognition of its discoverer, the lily bloomed most beautifully just outside the late plant man's window

brilliant *L. tenuifolium* with its deep scarlet, waxen flowers seldom grows more than twenty-four inches tall and some of the *elegans* varieties reach only twelve inches while *L. giganteum* towers ten or twelve feet high with individual flowers ten inches long.

Due to a variety of causes, lilies differ greatly as to their garden reliability. This is not unexpected when we realize the widely differing locations and conditions of their native habitat. Some grow at sea level while others inhabit rocky mountain sides at an elevation of eleven thousand feet. Some are found in wet meadows while others exist under almost desert-like conditions. Many will succeed in partially shaded places while others thrive in the open upon sun-baked hillsides. All, however, demand good drainage and almost without exception are found among some kind of a low ground-cover which acts as a screen to keep their roots cool and to provide protection for the young shoots in the spring. It is almost axiomatic, therefore, that all varieties of lilies cannot succeed in any one garden.

One of the great difficulties in the



AN IDEAL SETTING FOR LILIES

The background of shrubs sets off the chaste beauty of the flowers

past has been to secure healthy bulbs. We have been largely dependent upon imported stocks and they frequently arrived in such condition that failure was almost certain. Today, millions of quality bulbs are being grown in this country and we can get them at more seasonable times and with less likelihood of their being diseased. Within another decade we will probably not only be independent of the foreign markets but be able to get better bulbs from our own growers than from the imported stocks.

The amateur who seeks to enjoy a few lilies in his gardens will do well to select them carefully. If he is limited in space or funds the Regal is doubtless the one best variety to plant. Quantity production has brought the price down to where first blooming size bulbs are offered as low as three dollars a dozen and planting sizes at one hundred for two dollars. A dozen varieties that are recommended for the beginner are *auratum*, *candidum*, *croceum*, *dauricum*, *hansonii*, *henryi*, *pardalinum*, *regale*, *speciosum*, *tigrinum*, *testaceum* and *umbellatum*.

The literature of the lily is not profuse, but a few

volumes are most helpful. One of the best books is *Garden Cinderellas* by Helen M. Fox, priced at five dollars by Macmillan. If interest does not go that deep, W. E. Marshall puts out a book, *Consider the Lilies*, priced at one dollar. This book is illustrated with more than eighty colored plates and covers their culture quite fully.

As the gardener becomes acquainted with lilies, he wants to propagate them as well as to plant and flower them. Many are easily raised from seed and others can be grown from scales, bulblets or bulbils. Bulb seeds are offered by some growers and dealers by the packet, ounce or pound. Most varieties may be planted about an inch deep and the same distance apart in well prepared soil. The soil should be light and fine with a goodly proportion of leaf mold, which provides food and keeps the soil from packing and also helps to retain the moisture. Perfect drainage is absolutely vital wherever lilies are grown, either as seedlings or mature bulbs. If your soil has been well prepared and you keep the seed



NATURE'S GORGEOUS CANDELABRUM

The Oregon lily is one of the gems to be raised by the sweat of the gardener's brow

bed moist, most of the seeds will germinate within a few weeks. Cultivate them just enough to keep the weeds down and at the end of a year add an additional inch of leafmold soil. Some of them will bloom the second year and most of them the third. They may then be removed to permanent places in the garden.

Just where and how to plant lilies has always been a great problem, solved by understanding the needs of the particular varieties going into the soil. Almost without exception, lilies demand a light, porous, well drained bed. In their native hill-side homes they enjoy perfect drainage and it is little wonder they prove short-lived when planted in level and frequently imperfectly drained gardens. Of the twelve listed above, only *pardalinum* is native to this country and it is one of the few that will grow in heavy soils. It thrives in ordinary garden loam in either full sun or partial shade.

Three of these varieties, *candidum*, *croceum* and *testaceum*, are of European origin. They all like sun but appreciate some low

ground cover to shade the soil and the lower part of the stem. The other eight lilies are of Asiatic origin, and among them are some of the choicest gems of the lily family. There are few kinds as satisfactory as *hansonii*, *henryi*, Regal and *speciosum*. All are ideal in the hardy border, especially when they can display their perfection against some such background as a mass of shrubs, a hedge or wall.

Few amateurs make sufficient preparation for lilies.

Drainage should be provided for very carefully, and the depth to which one digs depends upon the variety of plant. The Madonna lily, *L. candidum*, should have no more than an inch or two of soil over it while the Regal and *auratum* should be covered eight or ten inches. *L. testaceum*, *L. martagon*, *L. pardalinum* and others are known as base-rooting varieties, as they form roots from the base of the bulb only. *L. regale*, *L. henryi*, *L. browni*, *L. speciosum*, *L. washingtonianum* and many others are stem-rooting varieties. They produce

(Continued on page 264)



ROMAINE B. WARE

AN EARLY BLOOMING TYPE

This dainty flower, *Lilium martagon*, grows in a Montreal garden



A LILY OF UNKNOWN ORIGIN THAT THRIVES HERE

The Nankeen lily comes from mystery-shrouded sources in Europe, but is popular in America. It is a creamy peach and mildly fragrant



JOE, THE TAMED SPARROW, CONSENTS TO POSE

He is no more afraid of the camera than he
is of humans or automobiles

A BIRD WHO THINKS HE'S HUMAN

BY PAUL F. HANNAH

ILLUSTRATIONS BY HAROLD GRAY

AN ENGLISH sparrow who believes himself a human being! Who refuses to associate with other birds, or to alight on any branch or tree! Who rides for hundreds of miles on the steering wheel of an automobile without fear, patronizes hotels and has to be sung asleep at night!

Such a creature is "Joe," the tamed orphan Mr. and Mrs. Alfred S. Jones of Washington, D. C., raised from infancy in their apartment. No dog could be more faithful to his master than this little brown bundle of feathers, and few children have found their way so completely into the hearts of their parents.

Joe has long since forgotten that windy day two years ago when Mr. Jones discovered him, a naked, red, day-old baby lying amid the fragments of his storm-dashed nest on a thoroughfare of the Na-

tion's Capital. Nor does he remember the anxious hours during which his foster parents forced warm milk down his throat with a medicine dropper to keep him alive. He probably has only dim recollections of the first time he discovered he could use his wings and fluttered

weakly, not out of a nest in a tree, as most of his kind have done, but up from a cosy cotton-wool home into human hands. All he can remember is association with people, who have treated him as one of their kind. The rough and tumble of the streets is a blank page to him.

His home is the bathroom of the Jones apartment, where his only feathered friend, Rippie, the canary, also dwells. The two are the best of companions, and Joe has learned to trill his notes much as the other bird. Never having heard the voicings of a sparrow, he has learned to



WHISPERING TO HIS MASTER

Joe speaks to Alfred S. Jones, who brought him up—or perhaps he is stealing a crumb from his lips

imitate the only bird he ever knew, and can fool all but the expert with his songs.

A meal is quite a ritual for the little bird. His diet now is quite catholic; milk, toast, meat, eggs and bread crumbs are among his favorites, and he either eats from a plate at the same table with Mr. and Mrs. Jones, or perches on Mr. Jones' shoulder to feed from a spoon. To see him pick daintily among the tidbits would never suggest one of his kind, fighting vociferously in the streets. He is probably the only sparrow that has become well-mannered.

During the day he plays about the apartment, in utter freedom, investigating everything. Once Mr. Jones brought home some peanuts, and left them in a coat pocket in a closet. Joe found them, and brought them out, one by one, to lay them in a row on the carpet. He has a particular affection for shiny articles, although he does not try to hide them, in magpie fashion. The bird revels in company, and acts as the family "watchdog." When the doorbell rings, he sings out loudly, then peeps under the door to see who is there. He loves to hop from shoulder to shoulder of family friends, and never shows the slightest fear.

When night comes Joe, after a busy day, is ready to sleep, but first must come the evening song. He clambers up on the knee of Mr. Jones, and from there into his cupped

hands, to nestle quietly while his human friend hums gently to him. Then he returns to his box, to sleep late into the morning. If Mr. Jones should return to the apartment after he has retired, Joe calls out, stretches one leg and then the other, and sleepily climbs into his master's hands for a midnight lullaby. He then is contented to be put back to bed.

Bathing is a daily performance for Joe. Mr. Jones cups his hands under a running faucet, and the youngster jumps in under the spray, much as an ouzel would do, chirping excitedly. He then crawls into a large turkish towel held by his foster-parent, and flutters his wings until they are dry. The sound of running water will always send Joe like a plummet to the faucet—he is forever ready to clean up once more.

It is as a tourist, however, that Joe shows how far he has separated himself from his fellows. No long wing-trips for him. He rides in state all over the country, perched either on the steering wheel or on Mr. Jones' hand. Not long ago the family took a two weeks' trip through Canada. Joe stopped at the hotels, where he was a model guest, took in all the sights, and rode day after day perched near the open car window with never an attempt to desert. Now the sight of an automobile throws him into a frenzy of excitement.

The scratching is good in Potomac Park—much better,



NO STREET-GRUBBING FOR HIM

The tamed bird eats out of a spoon, or at the table



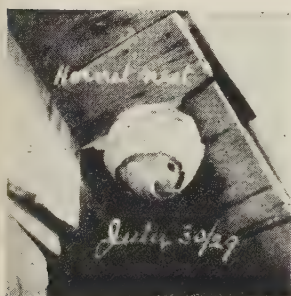
THE INDEFATIGABLE TRAVELLER

Joe looks over a road map with Mr. Jones to determine where they will adventure next

in fact, than in an apartment—and the little bird loves to go there. The first spring after his birth, Mr. Jones reluctantly took him down among the trees for he felt the instincts of his kind would send Joe winging to freedom. Joe was not interested, however. He scratched for gravel happily, and when Mr. Jones went to leave him, he flew to his shoulder, ready to depart. He has never touched foot to a branch or limb, so foreign to his experience, and to this day, will perch only on furniture or a human shoulder. He has none of the ideas of his kind.

Joe knows his name, and comes at call. He seems to

understand what is said to him, and learns new commands readily. There is no doubt but that he is happy in his human home, much happier than if he had to struggle in the streets for a living. He never seems to care for the precarious "freedom" he has missed, because he has never known it. He receives the affection he appears to crave, is well-fed, and has ample room for investigation, and that is all he desires. And he brings into a home a brightness and cheerfulness that only a bird can give. The Joneses have never regretted their act of kindness, for the orphan they rescued has paid them many times, in pleasure, for the trouble he caused them at first.



THE FIRST START

THE BUILDING GROWS

PHOTOGRAPHING HORNET CONSTRUCTION

BY LOTTIE ST. GEORGE



SOMEWHAT LATER

THE hornet's nest hanging under the edge of the shed roof was about the size of a tea-cup when I first saw it, and I swung my camera into action at once. Using a portrait lens on my 2-A Brownie and a piece of stove pipe wire as a measure to get the proper distance, I took the pictures from time to time, at a distance of about three and a half feet.

It was interesting to see how big the nest became in a short time. It was even more interesting, however, to discover that neither the photographer nor the many friends who came to view the building operations were stung all summer.

The hornets, in their construction, prepared a pulp of gum and wood, getting the gum from the balsam and spruce trees and the wood from old weather beaten walls and logs. These two elements they chewed together until they were of the proper consistency, then applied them, always walking backwards away from the new deposit to avoid disturbing it. I have also seen the little fellows use the gray matter at the base of the red and white pine

needles for their paper. Real engineers they are, certainly.

The nursery for the young is in the form of cells, lined with white paper. During the early stages the cells are sealed with white, but the partitions about them are of gray, giving the whole a variegated appearance. The nest is begun with only a few cells, and more added as they are needed. One morning, when a worker was busy on the door-way, a nurse wished to come out, so the worker stood aside and let her pass. Somewhat later another ventured forth, but did not wait for the worker to move. She rudely knocked him off his feet and majestically went on her way.

The workers dwell in the spaces between the partitions when they are building the spaces, and one can watch them go in to see if their home is comfortable and of the right size.

The nest when I cut it off the roof was 11 by 12 inches. It was composed of four layers of cells, although the usual number in most nests, I have discovered, is three.



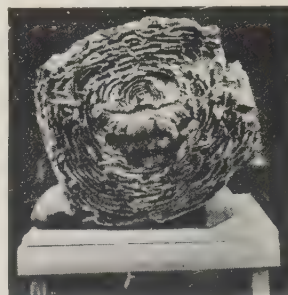
IT GROWS BIGGER . . .



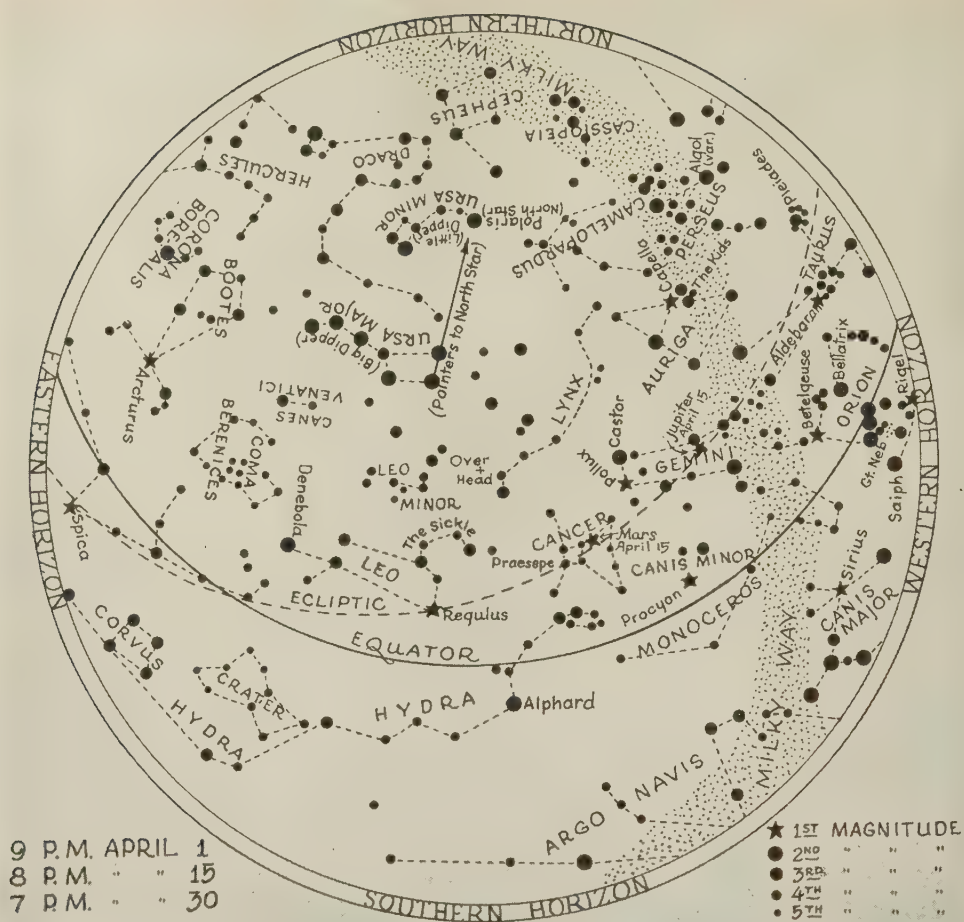
AND STILL BIGGER



A SIDE VIEW



A CROSS-SECTION



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

ASTRONOMY AND ASTROLOGY

BY ISABEL M. LEWIS

STRANGE as it may seem, there are many people today who are, apparently, not aware of the fact that astrology is a pseudo-science and not a branch of astronomy. They do not realize that it makes use of the heavenly bodies in very much the same way that a fortune-teller makes use of a pack of cards.

Astrology, soothsaying, fortune-telling and palmistry are all akin, and the astronomer is probably the least inclined of all scientists to have anything to do with astrology. Yet, amused or disgusted astronomers are continually receiving pleas to cast horoscopes and to foretell destinies. These requests come from anxious individuals who have very hazy ideas as to the rôle played by the heavenly bodies in the scheme of the universe. At the present time there seems to be an epidemic of "astrologitis" in this country. Newspapers, some magazines, and the radio are,

In view of the fact that interest in astrology and astrological predictions is widely current at this time, particular importance attaches to Mrs. Lewis' article expressing the viewpoint of the astronomer

apparently, responsible. People one would not suspect as credulous are studying their destinies in columns of the daily newspapers. They are taking seriously a variety of statements as to the in-

fluence of certain constellations or planets upon their private affairs.

It is human nature to crave for itself a personal share in everything. This wish extends to the stars. It is a thought flattering to man that the stars and planets may be controlling his destiny. Some appear to think this more interesting than purely astronomical truths about island universes millions of light years away, or even a new planet lying far beyond the orbit of Neptune. They are not concerned with the fact that if our planet and all of its inhabitants were wiped out of existence by some sudden catastrophe the news would have no appreciable effect upon the universe as a whole, or even the nearest star.

The average man of today prides himself upon the fact that he lives in a scientific age and that he keeps well informed upon current events. He reads of cosmic rays, protons and electrons, the structure of the atom and the nature of light. He even takes a keen interest in the theory of relativity and then, maybe to offset it all, he glances over the daily horoscope and gets interested in something discarded some three centuries or more ago.

There was a day when astrology ruled the world and astrologers were rich and powerful. During the Middle Ages their influence reached its peak. Astronomers at that time were having a hard time of it. Unless they were willing to cast occasional horoscopes some of them were apt to go hungry. Although Tycho Brahe was deeply interested in the science of astronomy he was also an astrologer of great influence, and extremely superstitious himself. Today he is remembered and credited only for his excellent work as an astronomer in cataloguing the positions of the heavenly bodies. The names of the great astronomers of the past are still remembered and honored. No man is honored as a "great astrologer." So false and contradictory were the astrological predictions of the past ages that, eventually, even the most credulous and easily duped turned from them in disgust, and the power and influence of the astrologers then rapidly declined.

In spite of the fact that today astrology is absolutely discredited it is surprising to know how many people are still unaware of this fact. This is evidenced by the great number of queries that astronomers are continually receiving, individually, or as members of staffs of observatories, on the subject of astrology and its relation to astronomy. Some people want to know if there is anything to astrology. Others ask for information regarding the astrological signs or how a horoscope is cast. If one has been dabbling in astrology for himself and has some ideas of his own on the subject he may decide that he will read his own fate in the stars and cast his own horoscope. He then asks the astronomer for the information upon which he bases his readings, the positions of the heavenly bodies upon a certain date.

It is probably because of the fact that the astrologer must come to the astronomer either directly, or indirectly through official almanacs, for the positions of the stars and planets on certain dates that confusion has arisen in the minds of many as to the relation between astronomy and astrology. The astronomer may good-naturedly furnish the astrologer with some facts regarding the heavenly bodies, but he is not accountable for the use of these facts.

As a government institution it is customary for the United States Naval Observatory to furnish to individuals who ask for it, by mail or otherwise, information on astronomical subjects provided too lengthy a calculation is not involved. People who seek information on purely astrological subjects are told, however, that the Naval Observatory does not furnish information of an astrological nature. It is doubtful, indeed, if any astronomer would know how to cast a horoscope or make astrological predictions of any kind. Certainly any astronomer worthy

of the name would feel that he had lost caste in his own profession if he should undertake to do so.

Astronomy has been called the noblest of the sciences and it is characteristic of the astronomers of today that they aim to keep it so. It is to be regretted that something cannot be done to divert the tendency shown by so many otherwise intelligent people today to read and believe the flood of astrological sayings and predictions. How much better to turn them to a consideration of the splendor and beauties of the heavens. There is no harm in studying legends and myths about the stars if one feels that it makes his interest in the stars more vital to know these interesting stories that have come down through the ages.

In April's evening skies we find Gemini still high in the west. This is the constellation, it will be recalled, in which the interesting new planet, Pluto, was discovered a little more than a year ago at the Lowell Observatory. So slowly does this planet move that it is still near the position in the heavens where it was discovered last year. It is now definitely known that Pluto is neither asteroid nor comet, as some insisted for a long time. It is now recognized generally as a bona fide major planet not greatly different in size from our own Earth.

Leo is one of the finest constellations of spring and The Sickle is its characteristic configuration with the first magnitude star, Regulus, at the end of the handle. It is now very nearly due south at nine o'clock in the evening. Denebola is the second magnitude star at the end of the lion's tail and it will be recalled that it forms a great equilateral triangle with Spica in Virgo in the southeast and Arcturus in Boötes in the east. Hydra, The Water-snake, now fills most of the southern and southeastern sky, and Corvus, The Crow, is the little quadrilateral of stars in the southeast that rests upon Hydra. Corvus and Crater, The Cup, next to Corvus on the west are known as The Riders of Hydra. Alphard is the brightest star in Hydra but is only a second magnitude star. The name is Arabic and means "The Lonely One."

The Big Dipper is now approaching the meridian in the north and is in its best position for observation. Spring is now here at last because Orion is sinking below the western horizon and the Pleiades and Hyades will soon be gone.

Mars is now in Cancer and is very near the meridian at sunset. It is still as brilliant as a star of the first magnitude. Look for it nearly midway between The Sickle in Leo and Gemini. Jupiter is in Gemini and the most brilliant stellar object in view. Its unflickering light reveals readily that it is a planet, for the planets do not scintillate.

Saturn is now in the morning sky. It is in quadrature with the sun on April 13 which means it is ninety degrees from the sun, and therefore on the meridian due south at sunrise. Venus is now a brilliant Morning Star, but low in the east at sunrise.

This is a fine time to observe Mercury. It reaches its greatest elongation east on the 10th and should be seen for fully a week before and after that date. It will be found in the northwest soon after sunset and does not set until more than two hours after the sun on April 10.

THINGS TO THINK ABOUT

Wasting Our Wild Life

As this is published, what is probably the most disastrous hunting season in history, from the standpoint of our American game species, is closing. A summer of almost unprecedented severity and drought coming at a time when many of our game species had reached a low point, has brought forcibly to our attention their grave condition. This is especially the case with the ducks and geese, to which abundant water is a necessity. The true situation was early recognized, and warnings were posted. Mindful, perhaps over-mindful, of the desires of the sportsmen, no general restrictions were imposed, but they were asked to refrain from taking the legal limits. The danger of becoming optimistic about waterfowl abundance, due to concentration on the fewer places supplied with water and food, was also emphasized.

In spite of these appeals, there is little evidence of self-restraint on the part of sportsmen. There is abundant proof, however, that concentration of ducks on such areas as remained congenial were usually considered merely as opportunities to take record bags, and to spread stories of duck abundance.

Let us refer briefly to another reason for duck depletion, the abandoning of cripples. California is conspicuous in this respect, though the proportion in that state is probably no greater than elsewhere. Competent authorities estimate that 5,000,000 ducks are brought to bag annually in California, and that at least 1,000,000 are crippled and lost (some actual instances show a fifty per cent loss).

Sometime, we trust, we shall attain a degree of civilization that will forbid such suffering and waste. The right of man to kill for "sport" will be defended by many, but where is the person who can justify the wholesale misery that is inflicted on innocent birds by such destructive practices that are so revolting to all fair-minded people, whether viewed from the standpoints of humanitarianism, esthetics, economics or conservation?

What Of The Mourning Dove?

As the dove season closes in those of the southern states that longest delay that event, those who love these gentle and beneficial birds wonder how they have fared during this stressful season. Remembering that, in the more arid parts of their range, water is used to lure them to their destruction, we wonder if the unusual drought has been invoked to hasten still faster the fate that hangs over them. We believe that the plight of the dove is not well understood. Occasionally someone who years ago knew the bird in its teeming abundance about the old home place will revisit the scenes of his boyhood and put on record in some newspaper or sportsmen's magazine the sadly changed conditions. The professional ornithologists study the nesting dates, and tell us that many of the birds are still

A PAGE DEVOTED TO CONSERVATION FROM VARYING ANGLES

breeding when the shooting season opens. The state game commissions seldom note the bird's plight, and continue to allow destructive seasons and methods. The federal authorities still allow the daily limit of twenty-five birds. The slaughterers still bait the fields, attracting the birds from a wide radius, and kill them by the hundreds, or surround the scattered tanks where they must drink.

Why should we wonder that here and there a southern writer, alarmed by the threatened passing of this lovely bird, lifts up a protest that is scarce heard above the bombardment of our modern life? Shall the mourning dove follow the passenger pigeon? Shall he be driven from the world?

Some time ago we published in booklet form "A Plea for Our Hawks" and "Our Disappearing Fur Bearers." These booklets are each illustrated with 12 colored plates of hawks and fur bearers respectively. The text of each pamphlet represents an important conservation argument. A limited number of these booklets are still available at ten cents a copy for single copy orders and at five cents a copy for orders for fifty or more copies. Address American Nature Association, 1214 16th St., Washington, D. C.

Bad Season For Quail

What is described as a nation-wide shortage of quail is reported by the American Game Protective Association. In Missouri, a state that within a year or two claimed to kill annually about 300,000 quail, the quail crop is said to be less than fifty per cent of normal, and hunters have been asked to limit themselves in their shooting. In Arkansas, Tennessee and Mississippi, states where quail were enormously abundant twenty or thirty years ago, the situation is extremely acute. There has been no legal cessation of hunting, though some attempts at restocking. With only a few thousand imported quail available for any one state, one may imagine what little effect this would have, especially since many of the birds would be killed before they had a chance to breed.

Tests For Prospective Hunters

There is a movement proposed by some of the Game Commissions to require each applicant for a hunting license to submit to an examination to prove his fitness for this privilege. This plan is born of the realization that our game species are being depleted rapidly, and that a new dispensation is needed. It is estimated by prominent advocates of this safeguard that one-half of

our game killed is taken out of season, and one-half of the rest by illegal methods, and that out of our six and one-half million licensed hunters, only about half a million are real sportsmen. We believe this estimate is a liberal one, and we are glad to note this tendency to recognize the true situation officially.

The tests proposed for prospective hunters include proved ability to handle firearms safely and effectively, knowledge of species that may be killed and their seasons, and the property rights of land owners. If we were conducting the tests, we would suggest certain other conditions—among them test of the applicant's knowledge of species whose killing is forbidden, and reasons why the vanishing remnant of our wild life that has miraculously escaped the horde of ignorant lawbreakers, whose ravages are admitted, should now be at the disposal of so small a fraction of our citizenry. But we hope the examination of hunters, by whatever plan, will be effected, for if they are made to pass any test that will result in a reduction of their numbers, we shall be going far.

Bay State Signs

While Massachusetts is waiting for its Supreme Court to test the validity of the anti-billboard law passed in 1925, a Sign Patrol is scouring the highways of the Bay State removing unlawful signs. It tore down from April to January some 25,000 posters, billboards, and political advertisements without violating the injunction that hamstring the Department of Public Works. The Billboard Law Defense Committee estimates that the law has already been worth millions to the citizens, and points to the destruction of some half million illicit advertisements since its passage. The only signs that are exempt are those advertising goods manufactured on the premises where the signs stand and those protected by the temporary injunction. Many ingenious attempts are made to bring billboards under the first category. Recently a manufacturer of brushes began to advertise on Massachusetts farms. When ordered to remove his signs, he protested, using a most amazing logic. He said: "Every pig is manufacturing bristles for my brushes, and they are doing it on the premises where the signs are put up." The Attorney-General, however, could not see it that way.

Will Water-Fowl Survive?

The National Association of Audubon Societies has come out flat-footed for restriction of hunting, to save America's wild water-fowl. Dr. T. Gilbert Pearson, secretary of the conservation organization, recently warned the National Game Conference that "the American people will not willingly see another species of wild bird life become dangerously scarce", and pointed out that water-fowl have recently passed through two bad seasons, making it imperative that a substantial shortening of the open season on ducks, geese and brant be effected if these birds are to survive.

Stars and Stories

D. Appleton and Company has issued one of the most unusual astronomy textbooks yet to appear on the market, and one that should have early popularity. It is titled *The Stars Through Magic Casements*, and follows the novel scheme of relating a legend, story or poem about a particular constellation and then giving directions for the location of the constellation in the heavens. Numerous sky-maps, decorative in character, and excellent wood-cuts by Edna M. Reindel enhance the value and appearance of the book. The author is Julia Williamson. The book has been edited with a view of appealing to students of the intermediate grades who, educational leaders have proved, are more interested in astronomy than in any other science.

National Monuments

The thirty-two national monuments, representing specific natural wonders of unusual merit set aside by Congress for permanent public enjoyment, are fully described in a 74-page booklet entitled *Glimpses of our National Monuments*. This is a companion piece to *Glimpses of our National Parks*, and like it, is issued by the National Park Service free of charge. The principal characteristics of each monument, with directions for reaching it, are set forth in the booklet together with pictures featuring its greatest attraction. A survey of this volume will indicate the diversity and unique character of the national monument system and should further inculcate the desire to "see America first."

Rabbits Increasing

Signs of more abundant wild life in Glacier National Park are seen by the Park Naturalist, George Ruhle, as a result of increase in the rabbit population during the last year. Rabbits, according to Dr. Ruhle, have never been numerous in the Park until recently, but reports of their abundance have been coming in all year, together with news that grouse also are increasing. Rabbits are more or less the bellwether of wild life. When plentiful, they perforce lend themselves to the increase of other species of animals and divert the attention of predators from birds and rodents. All Nature thrives with them; it likewise grows lean on their disappearance. Glacier National Park seems to be on the up-grade in mammal and bird population.

Smithsonian Studies

An interesting series of pamphlets on a wide range of scientific subjects has been issued by the Smithsonian Institution of Washington, D. C. They include: *How Insects Fly*, by R. E. Snodgrass; *Social Parasitism in Birds*, by Herbert Friedmann; *Heritable Variations, Their Production by X-Rays and Their Relation to Evolution*, by H. J. Muller; *The Transition from Live to Dead; The Nature of Filtrable Viruses*, by A. E. Boycott; *The Mystery of Life*, by G. Donnan; *Extinction and Extirpation*, by I. P. Tolmachoff; *Photosynthesis*, by C. C. Baly; and *The Lingering Dryad*, by Paul R. Heyl. These articles are all taken from the Smithsonian Report for 1929 and may be obtained from the Institution.



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NEW easy way to keep and show your snap-shots

No pasting, tabs or fuss—No white ink or pencil needed for titles. Write them on backs—You pass the prints, not the album—Several people can see pictures at once—Special groups kept together—Snap-shots can be taken out and rearranged, or discarded, at any time—Keeps six times as many prints as an album—New leaves can be added—Negatives can be kept with prints, if desired.

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Dr. William T. Hornaday has been in the thick of every conservation battle for many years, fighting stalwartly in the ranks of conservationists. He has led the friends of wild life again and again to scale the bulwarks of privilege, and recruited armies of untold strength by his vigorous pen and keen, scathing criticism of ineffectual game policies. He has been the Tom Paine of the revolution in public attitudes toward bird and animal life, and, like the friend of the French Revolution, has been accused by those who oppose his methods and ideas of everything but of a lack of sincerity, courage and singleness of purpose. He has now written a book which pictures wild life conditions in this country as he sees them. Titled *Thirty Years War for Wild Life*, this remarkable volume attacks the system of laws and public habits which permits the rapid diminution of game, verbally exterminates certain types of so-called sportsmen, and paints a dismal picture of conservation as existing at present. In the second part of the book, entitled "The Bright Side," the author does allow to shine through the sombre hues of his canvas a few glowing tones, namely, the work of the New York Zoological Society, the Migratory Bird Treaty, the End of Feather Millinery, the Permanent Wild Life Protection Fund, the Upper Mississippi Wild Life Refuge and a few other striking conservation promotions and achievements. These and whatever bright spots may develop in the future are not enough to overcome the dark, however, in the opinion of Dr. Hornaday, for the last nine words in his book are, "Think it over. But meanwhile, prepare for the Worst." The crying need, he feels, is humanity and courage in the hearts of men—these cannot be secured by raising funds or passing laws. The grand old fighter is not yet through, however—far from it; in his preface he voices his challenge for a greater battle: "Emerson Hough told the American people all about this—until he died. I will do the same—with a difference. If this mild effort does not lead to some reforms through Congress and some state legislatures, we will then take other measures to avert disasters that are impending. This volume is 'polite literature'; but if there needs to be a next one it is going to be so impolite as to demand judgment on all men and organizations who attempt to block the road to constructive conservation."

The book is privately printed by the Gillespie Bros., Inc., Stamford, Connecticut, as a Congressional edition, but is followed by a Book Trade edition from Charles Scribner's Sons at \$3.

New Nature Book

An attractive addition to the Nature literature adapted for the primary grades is *Mother Nature's Little People*, authored by Louise Jamison and published by the F. A. Owen Publishing Company of Dansville, New York. It follows the usual story-telling form, but has the added virtue of packing considerable Nature lore on each page. Almost every one of the smaller animals and insects is given an opportunity to explain his peculiarities and life habits. Suitable for the third and fourth grades, it is priced at 72 cents list, and 54 cents net.

NATURE IN PRINT

Familiar Land Birds

Seventy-two familiar birds of the land, not including birds of prey, are pictured in color and described in brief prose in an attractive and handy little bird book entitled *Glimpses of Familiar Birds* by William H. Carr, American Museum of Natural History. The selection of the birds to be covered was made by Dr. T. Gilbert Pearson, president of the National Association of Audubon Societies, and the color plates were all done by Merle V. Keith. On each left-hand page there is given a brief description of each bird together with its habits. Facing this is a color plate of the bird, beneath which is space for annotations by the observer. The book is pocket size. It is published by Samuel Gabriel Sons and Company, 74 Fifth Avenue, New York, and sells for \$1.50.

Poor Sportsmanship

Unsportsmanlike Sportsmen is the title of the latest pamphlet from the Emergency Conservation Committee of New York. It is written by that clear-minded advocate of conservation of wild life by killing less of it, Irving Brant, and is mainly a plea for support of an amended McNary-Haugen Bill, outlawing the use of live decoys and the baiting of wildfowl, and demanding long closed seasons on waterfowl. Two main contentions are: As sport, shooting over baited waters is more barbarous than the trap-shooting of live pigeons; and baiting means extermination.

The need for some such legislation is beyond question, judging not only from the evidence presented in the pamphlet under review, but also from countless revelations in current sporting literature. Those who read with understanding may discern abundant need for drastic reforms, even in the writings of those who are working at top speed to balk these same reforms.

The pamphlet may be obtained, as long as the supply lasts, by application to the Emergency Conservation Committee, 113 East 72nd St., New York City.

Back on the Farm

No matter how rapid the drift from the farm to the city becomes, there is always a steady literary trend from the paved streets to the quiet lanes and the hillside pastures. It is as if America, grown to maturity in the hurly-burly of lights and mechanical devices, wishes to remember its peaceful childhood close to the Mother that gave it first sustenance. *The Little Hill Farm*, by John Van Schaick, Jr., editor of *The Christian Leader*, is typical of this literature. It is a journal of the ordinary happenings during a few weeks' vacation back on the summer place, an old New York farm, and is interspersed with descriptions of rural life. Simply, quietly told, interesting in style and content, it is a worthy addition to "back-to-the-farm" literature. It is sold for \$1 by the Universalist Publishing House, Boston, Mass.

That universal topic of conversation, the weather, has been scientifically dissected to ascertain its causative forces in a volume recently come from across the Atlantic. It is *Climate*, written by W. G. Kendrew, M.A., the author of *Climates of the Continents*, and will interest the curious-minded as well as those in whose lives weather conditions play an important part. Dr. Kendrew discusses the great principles behind climatic conditions—insolation, and the wind systems—together with the minor factors, such as rainfall, fog, sunshine, and humidity, and goes further to depict a few of the climatic types existing in different parts of the world. He writes in non-technical style, yet manages to crowd his volume with a host of meteorological information such as rarely is collected between the covers of one book. The volume is printed by the Oxford University Press, at \$5.00.

Azaleas and Camellias

Macmillan has recently added to its garden library a worthwhile, instructive little book entitled *Azaleas—Camellias*, and written by the well known botanist, H. H. Hume. As the first volume on these plants designed particularly for the amateur, it is replete with information both on the varieties of the two plants and on their cultivation and care. Azaleas and camellias are increasing in popularity in the United States, the first for outdoor planting everywhere, the latter for use outdoors in the South and indoors in the North. Too little is known about effective selection of these plants, and Mr. Hume's ideas, based on long experience, will be welcomed by the gardening fraternity. The book is priced at \$1.50.

Planting Hints

Harry R. O'Brien, formerly editor of the Garden Department of Nature Magazine, and recognized authority of horticultural subjects, has recently prepared a booklet of garden information for the Union Fork and Hoe Company, of Columbus, Ohio. Entitled *Better Gardening*, it deals in concise manner with every phase of amateur planting, discussing the general principles of successful flower and plant raising as well as the requirements of particular flowers and plants. Much practical advice and worthwhile suggestion is contained in the attractive forty-eight page booklet, and the amateur will appreciate the courtesy of the Union Fork and Hoe Company, who are distributing it free on request.

Chestnut Blight

The ravages of the chestnut blight, which has destroyed millions of acres of native chestnuts and threatens to sweep the entire native range of the American chestnut, are discussed in Farmers' Bulletin 1641-F, recently published by the Department of Agriculture. The bulletin shows the effect of the blight on industry and lists uses for the killed trees. It likewise describes the extensive experiments now taking place to find a suitable foreign chestnut resistant to the disease.

Helps and Hints

FOR HOME AND GARDEN

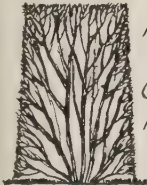
PLANTING THE GARDEN, MONTH BY MONTH

By Romaine B. Ware

"I am ever being taught new lessons in my garden: patience and industry by my friends the birds, humility by the great trees that will long outlive me, and vigilance by the little flowers that need my constant care."—NEISH

YEAR by year your garden knowledge should increase. As you plant and grow different things, you learn from each one. Of course you will make mistakes, but it is by mistakes that we gain knowledge and experience. Our gardens are just now entering a period of intense activity; everywhere Nature is overflowing with life and promise. It seems she is trying to make up for lost time. If our plantings are to develop as we have planned them, there is not a moment to lose.

This is one of the most important planting seasons of the entire year, and while in many cases fall planting is to be preferred, most of us feel the garden urge more just now. As everything around us struggles toward the fulfillment of its destiny, we must hurry to do our part. The gardener's duties are varied at this season, but planting easily tops the list. Maybe you think your garden is already fully planted, but there is no room for anything more. If this be the case, you must study where new and better things might be substituted



A WELL SHAPED HEDGE SHOWS CAREFUL TRIMMING FROM THE START



WIDER TOP THAN BOTTOM RESULTS IN POOR GROWTH. DOES NOT HILL UP

RIGHT AND WRONG HEDGE TRIMMING

For those already there. In my own garden I had a hedge of common lilacs, perfectly beautiful specimens, but when the opportunity came that made possible replacing them with choice French hybrid lilacs, I cut them out at once. Don't get the idea that what is, must be. Just because a plant has been in your garden for some time is no reason why it must stay there if something better is available.

All deciduous shrubs and trees to be

SOIL Texture absolutely controls plant growth

While plants and flowers depend upon a number of elements, soil texture *regulates* the functioning of them all. Soil texture, or its physical condition is the *very life* to plants.

With proper soil texture, plants breathe, secure their food, find correct conditions for root development—expand, grow. With improper soil conditions (sand, clay, inadequate humus) they wither and die or are poor and spindly. Poor results are usually due to improper soil conditions more than to lack of fertilizing elements, because correct soil texture is absolutely necessary to make the fertilizing elements available.

Give your plants the chance to grow a strong, virile functioning root system by conditioning the soil with G P M Peat Moss this spring. This organic matter contributes active or "live" humus to soil over a longer period of time than any other substitute medium. But, be sure it is G P M you buy. If all peat moss was of as high quality as G P M it wouldn't make any difference which you used; but it isn't, so be safe. In one and only one peat moss can you expect the best returns at least cost. When you use G P M your flowers and lawn will grow as never before. Let us tell you more about this. Get our literature and prices.



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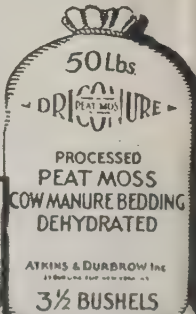
MAKES POOR SOIL GOOD AND GOOD SOIL BETTER



A REAL BEAUTY FOOD FOR LAWNS AND GARDENS

A healthy looking garden is always beautiful—but—health *only* comes from the *right* kind of food. DRICONURE is Nature's Own Fertilizer—contains all the vitalizing elements of deodorized fresh cow manure, and peat moss in readily available form. Nitrogen for foliage and growth; phosphoric acid for stimulating flowering and fruiting; potash for building tissue... in fact DRICONURE just "teems" with life-giving organisms so necessary to plant life... and it gives lasting effects that carry over a much greater period of time than the average fertilizer.

But better still, DRICONURE is really an old friend in a new form. It is cow manure from dairies where peat moss was used for bedding... specially processed. After the peat moss has become thoroughly saturated with the manure the whole is dehydrated, reduced, giving an absolutely safe fertilizer that will not burn, is odorless, free of weed seeds, finely granulated and pleasant to handle. Use it for top dressing lawns and in general garden work. It is safe!



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We shall prepay all Express or Parcel Post Charges on all dormant Rose Plants Purchased at catalogue prices.

This new policy will bring the famous Bobbink & Atkins Roses (dormant) direct to your door without any annoying extra charges.

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Roses, by Bobbink & Atkins

A new edition of this reliable Rose catalogue has just been completed. If you expect to plant Roses this spring, and have not received this 1931 issue, write us.

Bobbink & Atkins, Rutherford, New Jersey

Please mention NATURE MAGAZINE when writing for the Rose book



planted this spring should be in the ground as soon as possible. Large specimens or those in exposed places must be securely wired or staked that high winds will not loosen them. Be sure the wires or other support do not injure the bark. Magnolia trees seem to be an exception to the early planting rule and you need not hurry them. Some of the magnolias are very choice and make a wonderful show when in bloom. It is early also to move evergreens. When new growth is well started, Maytime is the better time in many sections. Always move them with a ball of earth so that the roots are never exposed, and if they are to be shipped any distance, it will pay to crate as well as burlap the ball of soil.

The planting of hedges is seldom done with the care their future value warrants. Soil preparation is important because they are to remain in the one place for a long



*A VIGOROUS ROSE
BUSH BEFORE
PRUNING.
BUSHY HABIT*

*HARD PRUNING TENDS
TO PRODUCE A FEW
EXTRA FINE BLOOMS*



*MODERATE PRUNING
PREFERRED BY MANY
FOR GARDEN EFFECT*

*LIGHT PRUNING OF
VIGOROUS GROWERS
PRODUCES QUANTITY
BLOOM WITHOUT QUALITY*



time. Dig the trench deep; add compost and well rotted manure down where the roots may reach out after them. Be sure the location is well drained. And as important as anything else is the pruning, especially of newly planted material. Seldom is it wise to plant large stock when starting a hedge. Better use short, bushy specimens and then prune them low and broad rather than merely cutting the tops off. Practically all hedges are thin at the bottom as they get older and this is generally due to two causes, planting specimens that are too old and not pruning them back sufficiently and secondly improperly shearing them as they develop. Hedges should never be wider at the top than at the bottom. Rather the top should be several inches narrower. This permits light and a better circulation of air to reach the lower branches and stimulates more healthy growth.

The proper shearing or clipping of a hedge, particularly during its formative years, has much to do with its successful growth. Privet, the commonest hedge plant, should be clipped early in the spring before growth has fully started. Throughout the year it must not be neglected, because when allowed to grow too much before trimming, the growth becomes thin and open rather than dense as it should be. If you cannot care for a hedge properly, better replace it with something not requiring

TEN Genuine \$3⁹⁵ Blue Spruce FOR ALL!

TEN sparkling Colorado Blue Spruce Trees for only \$3.95, no extra cost for delivery! Five-year-old specimens 9 to 12 inches high—double transplanted. Many requests have come to us for Colorado Blue Spruce. Because of their scarcity and the former high cost of production, we have never before been able to make such an offer on Blue Spruce. It has taken five years to bring these Blue Spruces to the point where we can offer them to you.

**Every Tree
Guaranteed
to Live!**

Any trees reported not flourishing within one year, will be promptly replaced without cost to you.

The Blue Spruce is a marvelous investment. The bluest varieties are like a silvery cloud on the lawn.

For Spring Planting

The best time for planting these evergreens in the Spring is from March 15th until June 1st. They will come to you glistening, fresh, vibrant. It is simple to grow these trees. Instructions for care and planting will be sent with your shipment. Little space is needed—you can raise these trees in a few square feet of ground.

If you can use more than ten, we will send you 25 for \$9.50, or 100 for \$35. This price includes delivery!

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Many of Nature's loveliest little plants are found in Rock-gardens. Building the garden and selecting the plants is a fascinating task, if you make

Our Catalogue of Alpine Plants your guide. It tells how to plan the garden, what plants to use, how to place them, and offers a number of choice collections of Rock-garden plants. Write today for a free copy.

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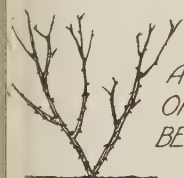
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ular attention. Boxwood should also be
pped early wherever necessary. As box
ws very slowly, any clipping must be
e carefully, taking off no more than
essary to maintain it within the pre-
bbed limits or to train it in the desired
pe.

Many perennials may be planted at this
e, especially those which bloom from
middle of the season on. Early bloom-
kinds are best moved in the fall. The
utiful Japanese anemones, with their
nty blooms in the fall, may be moved
w, but take plenty of soil with them as
y resent disturbances. Established plants
best left entirely alone; they should be
ntly mulched, but do not cultivate around
m as their roots and the young shoots
very close to the surface. Also in clean-
the garden don't disturb such late start-
things as mallow and platycodon. They

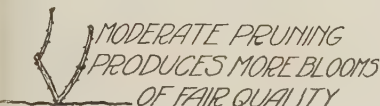


A ROSE BUSH
OF OPEN HABIT
BEFORE PRUNING

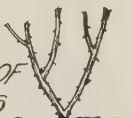
PRUNED HARD
FOR EXTRA
CHOICE BLOOMS



MODERATE PRUNING
PRODUCES MORE BLOOMS
OF FAIR QUALITY



LIGHT PRUNING
GIVES ABUNDANCE OF
MEDIocre BLOOMS



not show growth till after everything
e is well started and one is inclined to
r they are dead.

Established clumps of perennials such as
asters, phlox, helenium, Shasta daisy
others should be divided. Old clumps
t have become very crowded and matted
ould be taken up and the outer portions
y used. The central parts might be
oken up and planted in nursery rows
ere they will develop in a year or two.
early all perennials except peony, gas
ant, gypsophila and a few others must
e divided and reset every few years. That
the way to keep your borders young and
torous. It also permits enrichment of the
il not possible when filled with estab-
ed plants. As growth starts or even be-
e, it is well to begin spraying to check
rust or blight. Thoroughly drench the
owns and soil around them; then repeat
e spraying every ten days or two weeks
oughout the season.

The pruning of roses, either established
shes or those newly set out, must be done
oroughly. With all bush roses it is the
w wood that produces the blooms. Hy-
ld tea roses should be cut back to four
five inches from the ground and only
ar to six shoots should be permitted to
velop. Hybrid perpetuals, being much
onger growing, naturally need not be
ured as severely. Six to eight inches from

A Garden Full of Lilies

for
\$3.00

Lilies for Spring Planting

The American garden lover will be pleased to know that, where here-
tofore they have been obliged to plant their lily garden in the autumn,
they may now secure many of the finest lily bulbs for spring planting.

This has been brought about by the wonderful advancement made in the science
of refrigeration, with the result that commercial florists have been growing them
to bloom at any time of the year desired from bulbs taken from cold storage.

Special Offer—12 Beautiful Lilies for \$3.00

Three Bulbs Each of Four Fine Varieties

Auratum—The Golden-Banded Lily
of Japan.

Magnificum—The beautiful pink
spotted Lily of Japan.

Regale (Royal Lily)—The gem dis-
covered in the mountains of China.

Tigrinum (Tiger Lily)—A famous
lily widely grown in our country.

All bulbs of good out-door planting size. Plant in April and May for Summer Blooming.

Our 1931 Seed Annual sent on request

Stumpp & Walter Co

Branch Stores:
White Plains, N. Y.
Stamford, Conn.

30-32 Barclay Street
NEW YORK

Branch Stores:
Newark, N. J.
Englewood, N. J.
Hempstead, L. I.

HARDY GARDENS How To Get Sure Fire Results

YOU'LL agree that of first
importance is to definitely
know about each kind of
flower, the *how*, the *when*,
and the *where* of right plant-
ing and care. Unlike any other
hardy plant catalog, that's ex-
actly what is given in Way-
side's. You will also agree
that no matter how much you
know about right planting,
only quick results can be se-
cured with good husky, first



Reg. U. S. Pat. Off.

quality, full rooted, field
grown plants, that are at least
two years old. Just such are
what Wayside sells. All first
quality. No seconds. Send for
the catalog. See for yourself
the completeness of the cul-
tural directions. Make your
plant selections from the larg-
est and finest single collection
in existence. Which sounds
like blowing our horn a bit
loud. But you will find it isn't.

Wayside Gardens

MENTOR, OHIO



Experience the Pleasure of Growing a GRAFTED EVERGREEN GARDEN

HERE'S an idea every lover of trees and growing things will cordially approve. Order 12 of our beautiful Grafted Evergreens. Set them out in garden or lawn according to our simple directions. Watch them grow into fine specimens. These handsome Grafted Evergreens are about 18 inches tall and as wide in spread. They are sturdy, strongly developed plants—characteristic samples of good varieties—with a big ball of soil and roots on each.

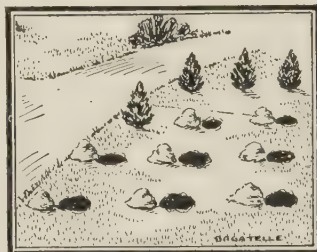
THEY ARE NOT SEEDLINGS

We have a special sheet of directions with diagrams to tell you exactly what to do so they will live and grow. This "Grafted Evergreen Garden" is dug to your order; balled and burlaped at once; shipped securely packed and protected, by Express collect, direct to you. Each plant is labeled in English and Latin botanical name, and on its stem a red mark shows just how deep to plant it. The price for the 12 Evergreens is \$25.00.

We are growers of nursery stock—devoting 150 acres to the propagation of good stock. Our prices are reasonable. New Catalog mailed on request.

BAGATELLE NURSERY

Box 207-H Half Hollow Hills
P. O. Huntington Station, Long Island, N. Y.



An illustration from planting directions

the soil is close enough. Newly plant climbers should be cut back to nine or twelve inches, but established climbers must never be pruned till just after blooming. With all roses, spraying or dusting should be started with the first signs of growth. Massey dust is generally considered the best thing to use. This is one part arsenate of lead and nine parts dusting sulphur. The dusting sulphur is a very fine powder, not the ordinary "flowers of sulphur". Massey dust is sold under various trade names or you can mix it yourself. Unless you need large quantities, however, it is easier to buy ready mixed.

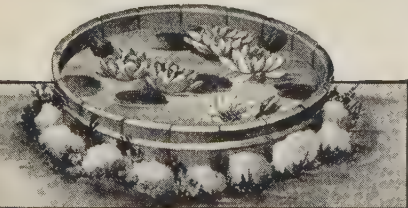
Should a serious frost threaten some of your plants, remember it is not so much the frost that injures them as it is the sun shining upon them while frozen. Screening from the sun or sprinkling with the hose before the sun reaches them will frequently thaw out frosted plants enough to save them. Gardens equipped with sprinkler systems find them valuable for this purpose. The winter covering should not be removed too early and sometimes it is well to keep part of it handy, that it may be replaced if frost threatens.

Spading or plowing of the garden cannot be started until the soil dries out somewhat. A good way to test soil is to squeeze a handful. If it remains a solid mass, it is still too wet to be worked; but if it falls to pieces or crumbles in the hand, then you may proceed with your work. Soil worked while too wet will form clods and be so lumpy that planting in it will be impossible. It does not pay to try hurrying things this way.

Many gardeners become impatient to start with the planting of bulbs and tender seeds and plants. Until the soil dries out and becomes somewhat warm, it is best to restrain these impulses. If you plant when the soil is cold and wet, seeds or bulbs may rot rather than grow. Besides, if they do live they merely exist and later planted material will make as good or better growth. When the trees are in bud is generally considered a safe time to plant the hardier annual seeds outside. With a cold frame this may be advanced several weeks. Some things like poppies and annual larkspur are best planted right where they are to grow as they seldom transplant well. Sweet peas should be the first of the seeds to be planted outdoors and it is almost impossible to do this too soon. They do best while the soil is cool and moist.

Hardy borders that have been established for some time must be fed if the plants are to continue thriving. Bone meal, pulverized sheep manure, shredded cow manure or even commercial fertilizers may be used though if your soil is inclined to be lacking in humus the latter is not to be recommended. Soils that lack humus must be fertilized cautiously as excessive amounts will tend to destroy even the small quantity of humus there is. There are numerous forms of commercial humus available and it pays to add them liberally to the surface of one's borders. A friable soil containing plenty of vegetable matter needs much less fertilizer to maintain fertility.

At this season you should carefully note the bulbs that strike your fancy and then you will know what to plant next fall. It is well, also, to plan now just where you will locate them. In groups of a dozen to twenty-five, scattered throughout the border



A WATER GARDEN for a Sunny Porch

May be used on lawn if you wish. This collection includes everything needed for a complete water garden.

- 1 Waterlily, Helen Fowler, pink
- 1 Waterlily, Odorata, white
- 2 Goldfish 1 Cedar Tub, 2 ft. diam.

Complete Collection Lilies, Fish, and Tub **\$5**

Shipped in ample time to give you almost unlimited pleasure this summer.

BEAUTIFULLY ILLUSTRATED CATALOGUE the new Waterlily "Mrs. C. W. Thomas" in natural color, with other lilies and Goldfish. A copy of this booklet will be mailed on request.

THREE SPRINGS FISHERIES
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SPECIAL LOW PRICE OFFER LAWN AND GARDEN FURNITURE



Large, illustrated catalog shows almost one hundred attractive pieces of furniture. Send 10c for your copy.

NEW CUSTOMERS SPECIAL OFFER

Each piece illustrated at left.

Article	Regular Price
1 No. 301 A Trellis	\$.50
1 No. 306 A Trellis	\$.65
1 No. 650 A Wren House	\$.50
1 No. 651 A Robin Roost	\$.50
4 Decoy Birds	\$.60
Regular Price	\$2.75
New Customers Price	\$2.00

Furnished K. D. and unpainted with all hardware, Nails and Screws. Shipping weight 14 lbs. Include Parcel Post Charges. Catalog free with each order and satisfaction guaranteed. Send your order today for this extra special value.

IOWA MFG. COMPANY
P. O. Box 180
SAC CITY, IOWA

20 GIANT ZINNIAS 10c

Send for World's Greatest Collection Giant Zinnias—famous for size and beautiful colors—easy to grow anywhere and bloom from early summer until frost. This collection includes 20 gorgeous colors, as follows:

- | | | |
|--------------|----------------|---------------|
| Bright Rose | Purple | Shrimp Pink |
| Burnt Orange | Sulphur Yellow | Cardinal |
| Deep Flesh | Salmon Rose | Canary Yellow |
| Lavender | Buttercup | Blush Pink |
| Buff | Cream | Violet |
| Ruby Red | Crimson | White |
| Orange | Deep Rose | And Others |

These Seeds—20 Colors in packet (over 100 seeds), 10c; 3 pkts., 25c; 8 pkts., 50c; 20 pkts., \$1.00.

Spring Catalog (233 varieties in natural colors) of Seeds, Bulbs, Shrubs, Roses and Perennials, mailed with every order or free on request.

F. B. MILLS, Seed Grower, Box 77, Rose Hill, N. Y.

KINKADE GARDEN TRACTOR

and Power Lawnmower

A Practical, Proven Power Cultivator for Gardeners, Fruit Growers, Truckers, Florists, Nurserymen, Suburbanites, Country Estates and Poultrymen.

New Low Prices—Easy Terms
AMERICAN FARM MACHINE CO.
1036 33rd Ave., S. E., Minneapolis, Minn.



Catalog Free

CACTUS—16 different varieties blooming size—each variety 32—from mountains of West Texas—2 of information.

C. J. Brooks, Box 15, Allamore, Texas.

ders, they will make delightful pictures. A good plan is to spot the places you will plant them and drive a stake, allowing it to project about two inches. These spots may be planted to annuals which will be out of the way by the time the bulbs go in. In this way you will secure effects unobtainable otherwise.

One problem that seems frequently to confront gardeners and has often been the subject of correspondence with this department has been that of labelling one's plants. It is not always easy to remember what has been planted and where, or, often, to recognize them later on, particularly if they are different types of roses. There has been recently gotten out, however, some fine waterproof horticultural labels, attractively green, with the designations in white upon them. They stand the wear and tear of weather in the garden and have withstood exposure tests with great success. If you would like some information on these labels, write to this department.

With the spring there also comes the perennial problem of the gardener—aphids. Almost everyone is familiar with the aphids that are found in such profusion on almost all kinds of plants and shrubs in what is called an "aphid year". Some years the aphid does not bother to any great extent because conditions are adverse to its growth. When conditions are favorable, however, aphids seem to develop almost over night to an extent that is highly detrimental to flowers, shrubs, gardens and other plant life.

The aphid comes through the winter in the egg stage. With the coming of spring these eggs hatch, the young being 100% females, and these are called stem mothers. The stem mothers establish themselves on the tips of twigs and immediately begin producing young in great quantities. These also are all females, and multiplication is continued at a rapid rate, the result in favorable weather being that the tips of the branches on the trees and shrubs are often actually weighed down by the volume. By some curious twist in Nature a brood of aphids bearing wings is produced as soon as the quarters get too crowded in a particular locality. This winged brood establishes itself in new quarters and continues producing more and larger families.

Cool, moist weather is favorable to aphids, and if spring comes off with that type of weather predominating, they are soon seen in abundance all over the place. The years 1927 and 1929 were "aphid years" in the territory east of the Rocky Mountains. After mid-summer aphids are not of particular importance as a pest. The damage has been done and the individuals left over to lay the eggs in the fall are hidden away and not ordinarily noticed on the tree or shrub.

Spray, and then spray, is the answer to the problem the aphids creates, and this department will be delighted to advise its readers and see that they receive material on the control of this pest.

PLAN YOUR GARDEN
FROM THE COLUMNS
OF NATURE MAGAZINE

Red Pine Hedge
Rapid Growing
Hardy, Dense



When Winter Winds Blow

Pine screens—or just two or three specimens on the exposed corner—form a living protection. Specially designed by nature to withstand heavy winds and cold weather, they are invaluable for this purpose.

Red (Norway) Pine

Absolutely hardy, a rapid grower, making a shapely tree and thriving on a wide variety of soil. Perhaps the best and most popular tree for all purposes. Seldom troubled by insects or diseases.

14 to 22 ins. twice transplanted
\$16 per 100, \$125 per 1000

Austrian Pine

Especially adapted to sea-shore planting. A fine lawn specimen and a good forestry variety. Bushy in habit, shapely, hardy, and healthy. Single specimens and groups for ornament making magnificent appearance.

10 to 18 ins. once transplanted
\$12 per 100, \$75 per 1000

Prices for larger sizes of either variety will be quoted on request

KELSEY'S SHORT GUIDE

to the best varieties of evergreens, trees, shrubs and other nursery products is now ready for distribution. All varieties are carefully described and carry the Kelsey prices, with unequalled bargains in many varieties. A copy will be mailed on request.

Kelsey Nursery Service, 50 Church St., New York City



ROSES from ROSE VALLEY

GUARANTEED

Extra-size 2-yr. field-grown bushes
—guaranteed to grow and bloom
or money refunded.
BYRON C. COLLINS
Owner and Manager

FREE BEAUTIFUL CATALOG IN NATURAL COLORS

Perennials, strong 2-yr. field-grown
undivided clumps, at special reductions.

3 Hardy Carnations — ever-blooming — 30 colors . . . \$1	GLADIOLUS 30 for \$1
5 Bright Phlox . . . \$1	Giant bulbs, grew 6 ft. high, last summer — 4 1/2" circ.
4 Giant Hollyhocks . . . \$1	DAHLIAS all colors 6 for \$1
4 Blue Hydrangeas, hardy, \$3	
4 Kinds Hardy Lilies . . . \$1.75	

FREE—Blue Hydrangea with order of \$3 from this advt.

ROSE VALLEY NURSERIES

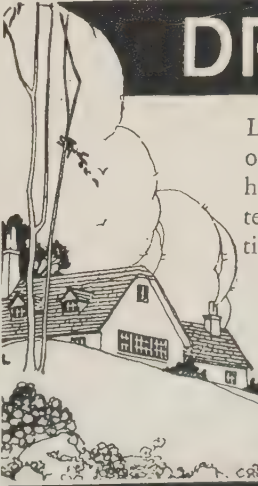
DEPT. H. LYONS, N. Y.

FIVE Everblooming Rose Aristocrats

Pres. Herbert Hoover—gold, terra cotta, orange and copper. Miss Rowena Thom—pink. Margaret McGredy—scarlet. Mrs. E. P. Thom—yellow. E. G. Hill—bright crimson. 1931 prize-winning roses—
2-yr. field-grown bushes \$4.90
—all 5 for

Another Rose Special

Limited to 1200 collections
Sunburst—rich yellow. Rose Marie—satin pink. Etoile de France—cerise. Red Radiance. Mrs. A. R. Waddell—copper. These
5 Everblooming roses—\$1.99
2-yr. field-grown . . .
Don't confuse roses from Rose Valley
with forced hothouse bushes.



DREER'S GARDEN BOOK

Long acknowledged the standard work on gardening. The 1931 edition pictures hundreds of flowers and vegetables and tells you how to grow them, and the fertilizers and tools to use for best results.

For a free copy mention this publication
and be sure to address Dept. L-3

HENRY A. DREER
1306 Spring Garden St., Philadelphia, Pa.



A MIRACLE! "Star Roses" planted now will bloom in June

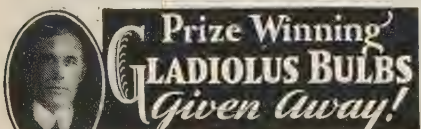
For a profusion of blooms all summer long, plan now. Plant field-tested "Star Roses"—for they are *guaranteed* to bloom.

This year's "Star Guide to Good Roses" shows the best roses for America—10 "Star" novelties and 200 "Star" favorites—many in color—and makes it easy to choose the best roses for your garden and your climate.

In our 34 years as rose specialists, we have never had better plants than are now ready for you. Early choice is desirable—send today for your FREE "Guide".

THE CONARD-PYLE CO.
Robert Pyle, Pres.

Rose specialists for 34 years
West Grove 343, Pa.



\$10 VALUE ONLY \$2

Here's a limited introductory offer made now to create thousands of new friends and customers. While they last, 40 acres of prize winning Gladiolus bulbs at way below former wholesale prices. Three each of 35 separate show strains, 105 full size bulbs (no bulbets). Includes many new and prized varieties. Yellow, white, scarlet, lavender-gray, rose, lilac, coral, etc., a riot of rainbow color. The envy of the whole neighborhood. Fill every vase in the house with beautiful cut flowers for over six weeks. Money-back guarantee. Carrying charges prepaid. Cash, check or money-order for only \$2 brings entire assortment of 105 bulbs, nothing more to pay. Act quick.

UNUSUAL weather conditions in our locality have now brought to flower lovers everywhere this once-in-a-lifetime opportunity. Prompt action enables amateur as well as connoisseur to fill a whole bed with choicest, prize winning strains for little more than the ordinary cost of a single pedigreed bloom. Also liberal FREE BULB OFFERS made this month to customers.

We are among the world's largest growers of fine quality, true-to-type and color bulbs. Gladiolus, Iris, Peony, etc., many of Europe and America's most select "show" varieties. Propagated here under ideal weather and soil conditions in the upper Mississippi Valley, these superb strains become unusually hardy and virile. There is not a so-called "bargain" bulb on our acreage. We never ship "runts" or bulbets. No "cheap" stock. Before you plant, send for our list of generous Special Offers. Learn how you can plant genuine "show" flowers this year for far less than ordinary ones would normally cost. Also get extraordinary FREE OFFERS. Write Quick!

PFEIFFER NURSERY
Dept. D-60 Winona, Minn.

Choose from Our 75 Varieties of Beautiful WATER LILIES

These richly colored, fragrant, easy-to-grow garden flowers may be planted from April until the last of August. Ours are the largest Aquatic Gardens in America. Every root *guaranteed*! 75 beautiful Varieties from which to make your choice in our free, illustrated Catalog. Send for it NOW.

The W. B. SHAW Aquatic Gardens
Dept. A, Kenilworth, Washington, D. C.

EVERGREENS

Native, Rhododendron Max., Kalmia, and Hemlock, Seedlings 6 to 18 in., 100, \$8; 2 to 4 ft. 25, \$5; 100, \$18; Carload for, \$150.00;

J. F. NORRIS Doeville, Tenn.

THEY TOIL NOT, NEITHER DO THEY SPIN

(Continued from page 250)

not only roots from the base of the bulb but also a mass of roots on the stem from where it grows out of the bulb to the surface of the soil. If these latter varieties are not planted deep enough, the stem roots can not develop and the bulb will perish.

Preparation for drainage should go a foot or eighteen inches below the base of the bulb. This entire depth of soil should be made light and porous by generous addition of leafmold. Plant explorers tell us that they find the wild lilies in pockets of leafmold soil where one sinks almost to his shoe tops. Other lilies are found growing in volcanic ash and lava debris. It is small wonder that when we plant bulbs in the ordinary border with little or no special attention they last hardly at all.

Hillside gardens, open woodland glades, pockets or bays amidst shrubbery, at the base of walls and many other locations are ideal for clumps of lilies. Some of the dwarf kinds are ideal in the rock garden, where the usual perfect drainage will suit them admirably. *L. tenuifolium*, *L. elegans*, *L. concolor*, *L. coridion*, *L. japonicum*, and *L. rubellum* are suitable for such a location. Some may last but a little while but the effect they produce is so charming that we can well afford to replant where they fail to survive.

In the hardy border some kind of ground-cover plant is desirable and there are numerous varieties that may be used. Among the perennials, Funkia, Hemerocallis, iris, peony, coreopsis, yarrow, dwarf alkanet, salvia (blue), platycodon and many others will do nicely. *L. superbum*, *L. tigrinum* and *L. auratum* are pleasing among rhododendrons, azaleas and laurel. Dwarf varieties of cotoneaster, Leucothoe, Andromeda and other shrubs afford excellent protection. That admirable ground-cover Pachysandra, which seems to grow equally well in sun or shade, is ideal for lilies.

What fertilizer to use, if any at all, has long been a mooted question as applied to lilies. Authorities differ and doubtless we still have much to learn on the subject. Almost everyone condemns all kinds of commercial fertilizers. Some recommend bone meal very highly. Almost all agree that very old, thoroughly rotted manure mixed with the soil a few inches below the level of the bulb will improve the results. Everyone condemns fresh manure no matter how it is used.

Several years ago Dr. Wilson sought to prove that lilies, especially his own discovery, the Regal, needed no fertilizer of any kind. In his own private garden, just outside his study window, he prepared a deep bed of leaf-mold soil, and therein planted several dozen Regal bulbs. It was my privilege to visit with him that year just as these lilies were bursting into bloom and I can not imagine anyone growing them more perfectly. One bulb had forty-two blooms and the mass made a wonderful show. In his valuable book, *The Lilies of Eastern Asia*, he pleads with all who possess or will possess this treasure "not to ruin its constitution with rich food." And he surely proved his case in his own garden.

Down through the ages the lily stands

... Destroy Insect Pests In Their Early Stages

Spray your flowers, plants, shrubs and evergreens frequently and thoroughly at this time with Wilson's O.K. Plant Spray to insure strong and vigorous growth throughout the season.



Wilson's O.K. Plant Spray is sold by leading stores everywhere and the genuine may be identified by the famous Trade Mark. Write us, if your dealer cannot supply your requirements.

Wilson's Awinc (Pyrethrum Spray)
Non-poisonous, highly concentrated PYRETHRUM spray. Easily controls more resistant type of insect such as Japanese Beetle, Red Spider, Rose Chafer, Cabbage Worm, White Fly, etc. Complete, requiring only a dilution with water.

Then there is Wilson's SCALE-O . . . the powerful dormant spray so necessary to the successful growth of fruit and other trees. Scale-O kills Scale insects and eggs—even in Winter. Mixes readily in cold water . . . covers very rapidly and evenly. 1 Gallon \$2.00; 5 Gallons \$9.00.

Andrew Wilson
Dept. V4
SPRINGFIELD, NEW JERSEY



MAKE your garden the envy of your friends with Gove's Sturdy Vermont Glads. Best of garden cut flowers—very easy to grow. Our special "get acquainted" offers will make you an enthusiastic "glad fan". Bulbs guaranteed to bloom first year.

100 Large Healthy Vermont Bulbs \$3

This collection includes at least 40 fine varieties, in many shades of Red, Yellow, Pink, Blue, Orange, Smoke, White, all fine ones but not labeled as to name. \$3 for \$4.75. All sent prepaid with complete instructions for growing prize-winners. I believe this to be the finest "glad" collection offered anywhere.

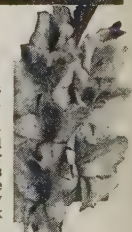
Send for beautiful color catalog "that is different," listing over 300 of the world's best varieties.

CHAMPLAIN VIEW GARDENS
ELMER E. GOVE
Box E-2 Burlington, Vermont



**The "Wonder Box"—
100 Bulbs—50 Varieties**

Here is your chance to get a collection of the world-famous Kunderd Gladioli for only \$2. My little "Wonder Box" contains 100 Kunderd bulbs; 50 varieties and many colors. Under normal conditions they will bloom the first year planted. Selected from the choicest strains of the finest Gladioli collection in the world. Send your order now—the supply is limited. Kunderd Gladiolus Book FREE. Use coupon.



A. E. KUNDERD
260 Lincoln Way West, Goshen, Ind., U. S. A.
Dear Sir: Enclosed find \$2.00 for which send me "Wonder Box" collections of Kunderd Gladioli. Send me the FREE 1931 Kunderd Gladiolus Book.
Name _____
St. or R. F. D. _____
City _____ State _____

out in myth, in religion and in architecture. Among the far eastern people, especially the Chinese, it is highly esteemed as an article of food. In ancient times, it was, with many other plants, used to cure diseases. A herbal dated 1597 tells to boil the roots in wine to cure certain ailments. In this day and age we have searched the far corners of the world and brought together many kinds of the lily to embellish our gardens. We treasure the flower for the beauty it brings to our borders and woodland and recognize in it the perfection of plant life and the most glorious beauty achieved under the cultivation of man.

Flowers Free

Spring brings to Holland and its miles of bulb fields marvellous sights, with endless rows of flowers in full glory. The Dutch grower, however, is not interested in the blossoms and sends his workers out daily to cut off the full blooms and thereby strengthen the bulbs for future flowering. The tourist is welcome to all the flowers he can carry away from the refuse piles beside each field.

New Forest Trail

The Forest Service is completing this month the last of a new Afton-Love trail which will link the northern stretches of the Maine-Georgia Appalachian Trail with the 200-mile trail system inside Natural Bridge National Forest in Virginia, and fill the last gap in the trail down to the Peaks of Otter, in Virginia. The work will make the heart of Natural Bridge Forest more accessible to trampers and horseback riders and complete 70 miles of good path in the Blue Ridge that winds over the ridges at an altitude of 3,500 feet. When the new trail is opened, it will be possible to take three-day trail trips through the Forest, stopping at cabins providing shelter along the way.

More Forests

The United States obtained title to 417,064 acres of forest land and the National Forest Reservation Commission approved purchase of 538,048 acres additional in 1930, Secretary of War Hurley, chairman of the Commission, recently told Congress. Most of the land has been cut over but is suitable for forest demonstration purposes. The organized forests are a source of employment during off seasons, the commission found.

Long Island Reforestation

More than half a million young evergreen trees were planted on Long Island, New York, during 1930 through distribution from the New York State Conservation Commission. Babylon, the only town on Long Island which has its own forest, planted another one thousand trees, while Brightwaters, the only incorporated village to take advantage of the state's offer to supply trees, bought six thousand evergreens. The largest single planting organization was Kings Park State Hospital, which set twenty-seven thousand trees in the ground.

THE BEAUTY OF HARDY FERNS



Cannot be described by any words at my command. You know how it is sometimes impossible to say what you feel. But these Ferns,—we have an immense supply of them, great big, waving Osmundas and Ostriches of the rich meadows and woodlands, the Crested Ferns and Sensitive Fern of the swamps, graceful Maidenhair and Bladderfern, Evergreen Wood and Christmas Ferns and tiny Spleenworts and Woodsias that seem about to fall off the rocks, until you discover what a toehold they have.

We want you to have some of these beautiful Native Ferns and make you the following offer, good until May first, 1931.

- 12 Cinnamon Fern
- 12 Maidenhair Fern
- 12 Hayscented Fern
- 12 Christmas Fern
- 12 Berry Bladderfern
- 12 Evergreen Woodfern
- 2 Climbing Fern, the very rare *Lygodium palmatum*.

All the above 74 Hardy Ferns for \$10.00 or one half the collection for \$5.50, you to pay express charges.

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FOREST NURSERIES, Doverville, Tennessee

PINE BARREN PIXIES

(Continued from page 228)

couple, they made their way across the water to a strip of sand beneath an overhanging bank. Six inches from them, a toad called lustily, publishing banns on a new betrothal. For nearly an hour, the pair remained there, unaware of toad or human spectator. Then they hopped to the water which was bedded with endless strands of Sphagnum. On this soft, gently swaying cradle were laid the precious eggs, each safely wrapped in coats of jelly. After leaving a small packet of perhaps ten eggs in one spot, they moved on to another Sphagnum bed. At last, when egg laying was over, they hopped into the brush and disappeared. Their family cares were over. What happened to their offspring was now a matter of Providence. They were no longer responsible.

That night I watched four romances of this elfin world, but not another male did I see jilted. Usually the females won out through sheer and shameful persistence. I smiled to see one of them mince toward a vigorous songster who continued his song, blissfully ignoring her presence. Three times she circled about him. She hopped up to him and nudged him, to receive the coldest of shoulders. She nudged him again. A moment of hesitancy, then the tide turned. He caught her and together they started off down the stream.

Next morning, in the rain pool, there floated thousands of snow-white eggs. Other matings had evidently gone on here, too. Under a hand lens, it could be seen that each little ball had already divided into halves and again into quarters. The tadpole was well on its way to creation.

As I stepped in to fill my collecting jar, there was a flash and innumerable velvety black pollywogs shot out from the grassy edge to the depths of the pool. Their bellies shone like gold and a clear, transparent spot stood out on their heads. I had never seen such pollywogs before. By process of elimination, they must be *Hyla andersonii*. Another chapter was added to their life story.

The last chapter came some weeks later, when summer was at its height and in its richest garb. Luscious blackberries and huckleberries hung bursting on the bushes, while flaming tiger lilies rose boldly among the ferns. A cicada buzzed his hot weather forecast from a hidden bough. I made my way straight to the rain pool in the corner of the bog. There was not a sign of life in the water, but looking along the edge, I caught sight of dozens of strange little creatures, with pollywog tails and yet perfectly formed legs. The tadpoles were just leaving their water abodes and their gill-breathing life and were being initiated into the world of land. In a few days their tails would disappear and they would become full-fledged frogs. I gathered a pail full of the midgits to take home with me. After watching their progress from earliest babyhood, I could not say goodbye to them now.

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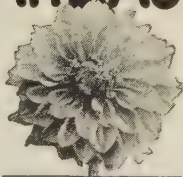
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THE WAYS OF SPILOGALE

(Continued from page 224)

only can *Spilogale* do the "hand-stand" but he can also walk on his hands—either forward or backward—better than any circus acrobat. The forward steps are quick, regular, and require no apparent effort at balancing. They are taken at the rate of about five per second, and may be continued for from two to three seconds before the hind feet are touched to the ground. Hand-walking backward is, of course, slower and more labored.

When the little spotted skunk feels called upon to use Nature's defense he will usually bend his body almost into a semicircle, both ends pointed toward his intended victim, so that he can see to aim while spraying. Several times he used this method to chase a black kitten away from the food, though seldom would he actually eject the volatile fluid. First he would walk toward the kitten till about two or three feet distant, then, swinging his rear around till it pointed with deadly aim, he would continue his approach sideways. After the first experience, when the kitten suffered severely, he rarely failed to take instant leave.

Ordinarily the skunk is loath to part with his scent and may resort to mere bluffing. I have actually seen one of them give up and retire from the scene when the kitten, conscious of having been repeatedly intimidated, stood his ground and refused to budge from the spot. Apparently the feline was acquainted with this individual skunk and knew him to be more bluff than action.

The food of the spotted skunk is composed largely of injurious insects such as grasshoppers, and many larvae. He is primarily carnivorous, eating small reptiles, mammals, birds and eggs whenever possible, and may vary his diet with mushrooms or small fruits. Observers agree that *Spilogale* is clean, curious, gentle and generally inoffensive, and his many virtues outweigh his new faults.

Watching for Birds

The Nature Study Club of Indiana, live-wire Hoosier conservation group which this year entered into its twenty-third year of active existence, is keeping a permanent record of the first arrivals of birds in the spring. Miss Margaret R. Knox is the keeper of this log, and members all over the state are reporting their finds to her. This work is of utmost value to ornithologists, and clubs in other localities will perform a fine service by establishing a similar system.



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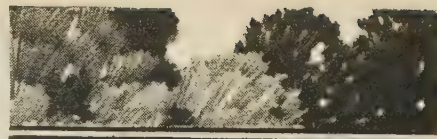
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Report on Game Policy

A Report on an American Game Policy, prepared by a committee appointed in 1928, was presented and discussed at the 17th Annual American Game Conference held in New York City early in December, 1930, and was favorably received. The members of the committee who signed the report were: Aldo Leopold, Chairman; S. F. Rathbun, William J. Tucker, John C. Phillips, J. W. Titcomb, I. Zellerbach, Seth E. Gordon, George A. Lawyer, John B. Burshaw, R. Fred Pettit, P. S. Lovejoy, Paul G. Redington, H. C. Bryant and A. Willis Robertson. The eminence of these people in game conservation confers authority on the document.

The Report is a long one, covering twenty-three printed pages. Many points of this complicated subject are covered, but lack of space precludes full discussion here. We must, therefore, confine our comments to certain features that are especially significant to Nature lovers.

The need of recognizing conservation as a broad subject, and of being guided by the results of impartial research in such details as the control of supposed predators, is stressed.

The establishment of numerous sanctuaries is advocated, and the possibility is suggested certain methods and equipment now used in taking game may be found to be unduly destructive.

Under predator-control, several important points are emphasized, especially the need for careful fact-finding, and the necessity of differentiating between species.

It is declared that no public agency should practice control in any region without establishing adequate fact-finding.

Rare predatory species should not be subjected to control.

Use of poison, bounties, national advertising, organized competition or other methods unlikely to discriminate between species or between varying local conditions should be resorted to only in emergency or under careful safeguards.

In the case of native versus exotic species, the native species should receive first consideration.

We are glad to see these and other recommendations made. If they are widely and conscientiously put into practice, there is still hope for our native game species.

How Butterflies Taste

Butterflies taste with their legs, which are 1,600 times as sensitive to sweetness as the human tongue, Almeda Anderson of the University of Minnesota recently told the meeting of the American Society of Zoologists in Cleveland. Miss Anderson's tests included 54 Monarch butterflies. These creatures were able to detect concentrations of cane sugar solutions only one sixteen-hundredth as strong as the weakest humans can taste. The butterflies were not affected, however, by water or milk-sugar solutions, Miss Anderson's experiments showed.

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New York Conservation Week

New York's Conservation Week, to be observed from April 1 to April 7 this year, will be opened by an elaborate conservation program under the direction of the state and city federation of women's clubs at Wanamaker's Auditorium, New York City, according to Mrs. C. C. Marshall, in charge of the event. Among the speakers will be Horace M. Albright, director of the National Park Service; Herbert F. Prescott, secretary of the State Conservation Commission; and Frank B. Myers, of the New York State College of Forestry. Conferences on conservation subjects will feature the morning session, together with a demonstration by Dr. P. W. Zimmerman of the successful propagation of holly. During the afternoon, conservation work of the girl scouts will be presented, and slides showing tree-planting ceremonies in memory of the late Stephen T. Mather will be shown. A unique part of the program is to be an indoor tree planting for Mr. Mather. The Women's Clubs extend an invitation to the public to help them observe the opening of Conservation Week.

Cumberland Falls Safe

All is quiet along the Cumberland—at last. The long fight to save Cumberland Falls, one of Kentucky's supreme scenic assets, ended in February when the State and the Insull interests agreed to a price of \$400,000 and Mrs. T. Coleman duPont and the other heirs of the late Senator duPont, turned over \$170,000 to supplement the \$230,000 previously given by the native son to his State. The struggle to prevent the commercialization of the falls began as early as 1925 and was carried on unremittingly by the National Conference on State Parks, the Louisville Times, edited by Tom Wallace, the Kentucky State Park Commission, the American Civic Association, Nature Magazine and other conservation organs. In 1930, the state legislature voted to accept the duPont offer of \$230,000 and authorized condemnation to procure the area. The final settlement rendered condemnation proceedings unnecessary, and gave full victory to the host of organizations which sought to preserve the scenic character of the falls.

Signs Stop and Go

Storm warnings are flying in all parts of billboardia during early 1931 and undoubtedly will stay up all year. One particular tempest recently broke over the buyways of Long Island and resulted in a thorough clean-up of roadside signs in Nassau County, New York, by the Roadside Committee of the Long Island Chamber of Commerce cooperating with the State Highway Department and the Nassau County Police Department. All snipe signs tacked to trees, fences and buildings and other signs illegally placed within the highway rights of way or on private property without written consent of the owner were removed by a crew of two men with a truck. After improving the appearance of Nassau County, the tempest is scheduled to hit Suffolk County. Interestingly enough, funds for the crew are being supplied by the Chamber of Commerce from special "unemployment" donations received from Nassau County residents.



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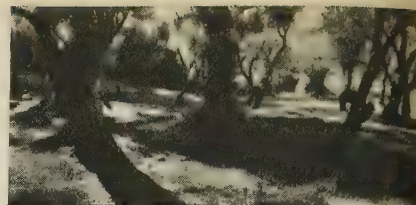


"WADDLINGS"

GRAFLEX NEGATIVE



EDITED BY ROBERT T. LOWELL



SUNLIGHT AND SHADOW

TRY—FOR INSTANCE "A WORM'S EYE VIEW"

A DECADE ago no picture taker would have thought of pointing his camera toward the sun or of tilting it at a decided angle when snapping a picture, provided he had received the proper training or was following the advice put forth in instruction booklets.

Within the past few years things have changed considerably and now we have striking and almost startling picture records of things in general. Notice the illustrations in newspapers and magazines by leading advertisers. Bold, odd, forceful, fantastic and withal, different!

It is believed that this all started with the professional motion picture camera operator ignoring all previous so-called, "iron-bound" rules of the game. The first thing he did was to shoot *into* the light. Next, he made pictures from odd angles securing a "worm's eye" as well as a "bird's eye" view. Panchromatic Film helped him to get striking and artistic effects in his pastoral and travel scenes. The pictorial photographer followed, cautiously, but surely and in today's salons of pictures made by photography we are treated with a variety of new and for the most part not unpleasing material.

Now the amateur snapshotter is doing things he never thought of undertaking before. He finds that by shading his lens from the glare of the sun he, too, can make charming back-lighted pictorial records. For many things he has disregarded the rule to hold the camera level—he points it down, he points it up—and though in many instances he gets weird effects from untrue horizontal and vertical lines, the results are nevertheless interesting; mainly perhaps because they are startling and different.

After all, why not—if the pictures please? Of course, if he is wise he will not waste many exposures in making things that have no value at all, not even as curios. He is learning much, however, from experimenting.



FOUR
MINUTES

f.11
STOP OPENING

A RAINY NIGHT PICTURE

April Showers

WE are cautioned, and rightly so, not to make snapshots with the ordinary little camera unless the sun is shining. That's good advice for the beginner but there are times and places when the sun is not on duty where successful snapshots can be made with even the inexpensive box type outfit.

You have noticed probably that the light is quite bright during or just after some of our springtime showers. Pictures are then possible if the subject we wish to take is out under the open sky.

Often the rainy day picture is most attractive when we get long reflections from wet streets and highlights here and there from streaks of water.

Night pictures like the one of the Capitol reproduced on this page require a time exposure. Of course, with the more elaborate cameras having fast lenses, cloudy or rainy day pictures are easy with snapshot or instantaneous exposures. Today the photographic field is broadened for amateurs.

SHADOWS— Their Pictorial Value

THE importance of shadows should not be overlooked. Pictures consist of light and shade. The beauty of a picture is often dependent as much on the delicacy of its shadows (or again on the contrast between shadow and highlight) as on its general composition.

Different types of pictures can be made of one subject—due to changes in lighting. Watch the shadows in a woodland scene or nearby bit of landscape. Observe how they lengthen as the afternoon advances. It is interesting to make a number of pictorial studies of the same subject under varied lighting conditions. Unusually attractive pictures can be made when the shadows from trees have lengthened, by snapping them with the shadows extending *toward* the camera. In such cases, care should be taken that the sun's rays do not strike into the camera lens.

Do You Know That—

The most pleasing pictures of moving objects are usually obtained when the subject is traveling diagonally across the field of view?

A small stop opening must be used when both nearby and distant objects are to be sharply defined at the same time?

It is always best, when making a portrait, either indoors or outdoors, to use a reasonably large stop so that the background will be subordinated to the principal subject by being out of focus?

High lights are the portions of a picture upon which the greatest amount of light is centered—the densest portion of the negative and the lightest portion of the print?

A diagonal, rather than a full view of a building, is usually more pleasing, particularly if a portion of the building is in shadow?

Stains on negatives and prints are generally due to insufficient fixing, or to insufficient washing?

A STUNT FOR THE ALBUM

PAGES THAT ARE UNIQUE, ATTRACTIVE

HERE is a stunt that produces unique pages in the snapshot album. Instead of pasting the prints on the pages in the usual manner the images are cut out with a pair of scissors and the cut-out figures are then attached in the album.

With regard to shaping and position, a decidedly interesting effect is secured. The figures can be placed on the pages with a good photo paste but the better scheme is to use what is known as dry mounting tissue. This may be attached to the back of the entire print before we start work with the scissors. Then when the background is



By cutting the image out we can often get rid of an objectionable background

trimmed away from the image, we have the figure properly backed up with the dry mounting tissue. Place it on the album page and give a little pressure with a hot iron. This makes the print lie flat and in absolute contact all over. Any camera shop has the mounting tissue.

Often, in order to catch a natural expression or attitude of the children—or anyone for that matter—we have to snap the picture without regard to what is in the background. Sometimes the surroundings are objectionable from a pictorial point of view. With such pictures this scheme is a decided advantage.

Nature School

Announcement has been made by Dr. Robert E. Coker, Director of the Allegany School of Natural History, of the faculty for the fifth season of the school starting July 8 and ending August 27: L. E. Hicks, Field Botany; Aretas A. Saunders, Natural History of Birds; Prof. William P. Alexander, Nature Study; Dr. Robert E. Coker, Field Zoology. The instructor in Physiography and Field Geology will be named later.

There is the period of life when the spirit of adventure and exploration is keen. A trip to the country, a look into the mysterious woods, or an exploration up stream grip the heart. The beauties of Nature, the wild flowers, the trees, the marvelous insect world are discovered by willing eyes, unafraid of criticism.

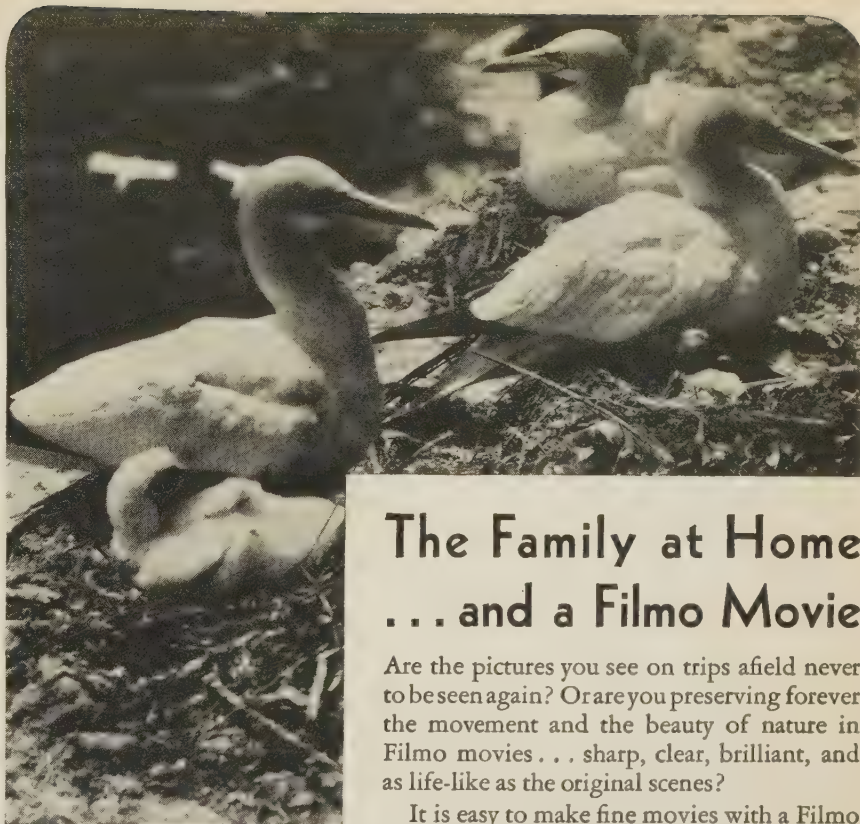
In such surroundings one can observe and study Nature at her best at the Allegany School of Natural History. The school was established in Allegany State Park in Western New York to meet the need for outdoor experience and training in the study of natural history. Students and staff live in the midst of wild Nature enjoying the wholesome experience of life in the forest together with unusual educational facilities and stimulating associations.

Teachers in public schools and colleges, particularly those who have had little opportunity for field studies, university and college students, scout and camp leaders of various kinds, young and amateur naturalists, and those interested in the Nature work of museums, public forests and parks, should find in this outdoor school the opportunity to broaden their experience, advance their training, and receive fresh stimulus.

Conducted by the Buffalo Society of Natural Sciences in cooperation with the New York State Museum and affiliated with the University of Buffalo, college credit is given in the College of Arts and Sciences of that University in the amount of three semester hours for each full course completed at the school. The general educational supervision is furnished by Dr. Charles C. Adams, Director of the New York State Museum, who for many years has given special attention to outdoor instruction in natural history.

A Sweet Tooth

A six-foot Douglas fir with no branches for about 45 feet up the trunk and worn smooth on one side except for innumerable claw marks, stands in Mt. Rainier National Park as witness to a bear's love for honey, according to Preston Macy, Assistant Chief Ranger, writing in *Mt. Rainier Park Nature Notes*. Some sweet-toothed bear had made the difficult climb up to a cavity near the top to dig out the store of sweetness a bee colony had prepared, and had evidently weathered the stinging rebukes administered by the rightful owners against this depredation. An ideal seat just below the cavity had allowed him to sit down while eating from the bottom of the cavity, but claw marks around the top showed that he had to stand to get the rest of his meal. "Bear, Mr. Macy writes, will never keep away from a hive, once he has tasted honey, and such industry as was displayed in scaling this forest monarch is quite unusual.



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BELL & HOWELL FILMO

Moose Trees Photographer

Jack Rose, cook for a trail crew at Thorofare Station, Yellowstone National Park, wanted a moose picture. He wanted it so much that he spent every morning down in the meadows along Thorofare Creek, looking for moose. Finally he saw a bull and a cow placidly grazing—but only for a moment did they continue to do so; and what the bull lost in placidity he made up in momentum. Jack reached a tree only a few leaps ahead of the irate animal. In his haste, he dropped the camera, and every time he tried to get it, the moose, grazing nearby, put him up the tree again. Finally, after several hours, the moose left, and Jack came home, quite convinced that moose, like certain famous Americans, do get peeved at camera-men.

Pennsylvania Summer Camp

The summer Nature Camp operated by the Pennsylvania State College for Nature teachers and Nature study lovers will open June 25 in the famous Seven Sisters Mountains near the centre of the Keystone State. Courses covering first, second and third year work will be offered under a trained faculty experienced in Nature teaching. Two camps will be held in 1931, the second beginning July 25. The Nature school is ideally located amid natural surroundings replete with wild life and interesting flora. Numerous Nature Trails have been laid out and marked and nearby forest nurseries offer additional possibilities for study. Each camp is limited to 60 students, according to Director George R. Green. The winter headquarters of the camp is at Pennsylvania State College, Pa.

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Novel Aquarium

The Cleveland Museum of Natural History has recently opened a novel aquarium room designed not primarily for live fishes, but for the exhibition of the smaller forms of life of land and water. Now the room holds fishes that line up like a platoon of soldiers when a visitor appears; a snapping turtle with a neck as long as his shell; a snail that gives birth to young every few months; a salamander so plump that he floats with ease; seven thick bullfrog pollywogs doomed to lose their tails next June, and a mass of mud set to see what living things were buried in it for the winter. When spring comes, however, its appearance will change—different kinds of bugs, beetles, moths and butterflies will crawl out of their winter sleeping bags or hatch from eggs laid last fall, and the room will resemble an insect room more than the usual type of aquarium. The room was planned by John C. Pallister, museum entomologist, and constructed by Superintendent George A. Hawker.

Raising the Koala

The famous Australian teddy-bear, the koala, on the import of which the United States Government recently placed a ban to cooperate with Australia in its preservation, is being raised in captivity for the first time by a young and enthusiastic Nature-lover, Noel Burnet. Although Australian zoos have failed many times to accomplish this feat, Mr. Burnet, after a four-year study of the animal, successfully established it in a 40-acre park at West Pennant Hills, N. S. W., a few miles out of Sydney, and is entertaining the crowds who come out to see them with 25 healthy specimens. The koala is one of the most interesting marsupials in existence, but has been dwindling rapidly due to the destruction of its food supplies and forests and to intensive shooting and trapping. It is thoroughly docile and makes a fine pet. Mr. Burnet's effort at conservation and the lesson his park is teaching may turn the tide in favor of the preservation of this creature and lead to a ban on its destruction in the near future.

New Bird in Yosemite

Another bird has been added to the long list of visitors in Yosemite National Park. On October 6, 1930, Ranger Naturalist Enid Michael and a companion, out taking moving pictures of bears swimming the Merced River, spied a new kind of duck on the water of a little lagoon. The creature seemed frightened, but Miss Michael crept up on it before it flew, and recognized its brilliant green scapulars as it vanished from sight. It was a green-winged teal, far off its usual beat.

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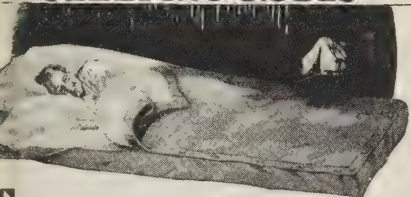
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British Guiana—Want to Go?

Nearly forty students, comprising several groups organized by Professor Harold D. Fish, have spent the summer at the Jungle Laboratory of Tropical Biology, at Kartabo, British Guiana, South America, since 1924. Their experience has resulted in rapid promotion in science since that time. Many hundreds of requests have come from others wishing to make the trip, and an increasing number, who have little or no scientific training, also have sought opportunity to go. It is possible that they will be given their chance this summer.

The "Lost World" region of Conan Doyle is back on the Guiana-Brazilian border, and before that is reached there are tremendous waterfalls. One summer Professor Fish, accompanied by a student and a negro, and finally aided by a group of Patamona Indians, went far into the Guiana hinterland by canvas canoe, to Kaieteur Falls, 741 feet high, nearly five times the height of Niagara. Only about twenty miles away, airline, is another fall 460 feet higher than Kaieteur, more than seven times the height of Niagara, Amaila Fall, 1,200 feet sheer drop. It never has been photographed. Professor Fish is thinking seriously of making a pictorial survey of this region during the summer of 1931. With the aid of the American Geographical Society, a river traverse may be made of some of the smaller tributaries, and other minor geographical work attempted.

While the trip will be in little known territory, it will not be exploration, properly speaking. At no time will the party be far from civilization or in danger of hardships. It will be a most unique and delightful vacation, costing about \$1,000 per person from New York and return, and requiring about nine weeks. There will be no real scientific objectives. An eye-opening experience is all that is expected. Very little expensive equipment, other than tents, canoes, and motors will be purchased.

Any who are interested, especially scout masters or biology teachers in secondary schools, regardless of scientific training, should communicate at once with Professor Harold D. Fish, Tropical Research Corporation, Southern Building, Washington, D. C.

It is interesting to note that the marked advantages gained by students who have taken the trouble to make such trips has been sufficiently conspicuous to cause interested people to organize and incorporate the Tropical Research Corporation, of which Professor Fish is the Executive Officer. The Board of Directors includes a distinguished group of American business men.



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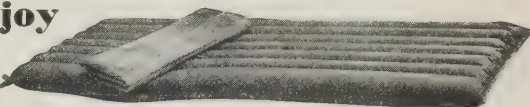
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Logging

Out of the flood of printed words about forests and forest people only once in the bluest of blue moons comes a book combining close intimacy with the woods and a native gift for good writing. Now *We're Logging!*, by Paul Hosmer, does just that. It is a book about loggers and logging, about lumber camps, lumber mills, log drives, and woods bosses, a book with the smell of pine forests and racy as the speech of the camp cook. Hosmer takes us through all that strangely assorted company who follow the logs from the forest through the mill—the logger, the manager, the book-keeper, the logging boss, even the forester. Hosmer has pictured them all in their human strength and weakness—and always with a smile.

Not the romantic, untrodden forest does he bring us, but the busy logging woods where one hears the crash of falling timber, the clink of the rough lock and the whining of the saw. His men speak the language of the logging camp and the mill yards. Their humor is broad and vigorous, their laughter deep-throated and often Rabelaisian, and out of all this Hosmer catches and translates the thrill of that greatest of American epics, the conquest of the forest, and he gives it back to us humorously, whimsically and with drama on every page.

The book is published by the Metropolitan Press, Portland, Oregon, and the price is \$2.00.

Economy Strikes

Hard times have hit the National Park publications, and those who have been interested in the Nature Notes issued from the headquarters of the different parks must run the risk of impairing their eyesight as a result of governmental attempts at economy. They are now mimeographed on both sides of the sheet, making them almost impossible to read and utterly useless as newspaper clippings.

Active Society

The Minneapolis Natural History Society has been conducting an interesting series of programs during the winter and spring and has attracted strong support from the Twin City. Talks on home aquaria, bird sanctuaries, Nature study in scouting, and economic value of reptiles have featured the series of monthly lectures. The officers are: Miss Gratia Countryman, president; Mrs. A. L. Sanford, secretary, and Dr. H. E. Karnofsky, treasurer.

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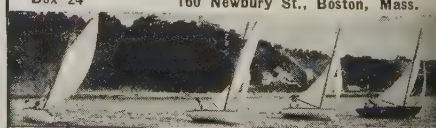
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Texas Pine Park

an effort to preserve at least one remnant of the great pine area of 15,000,000 which once covered Texas, the state legislature recently appropriated \$25,000 to be matched by private contributions of like amount for the purchase of a tract of virgin long leaf pine forest land. The purchase, when made, will be set aside as a park and game refuge, according to the terms of the appropriation. Most of the long leaf pine in Texas is now held by a few individuals and companies in Newton and Jasper counties, and the stands are worth \$150 an acre. A drive is now under way in the Lone Star state to raise the \$250,000 needed to match the legislative appropriation and establish the park.

Nature on Air

The Ohio School of the Air, a coöperative experiment conducted by the Ohio State Department of Education and school officials and teachers, broadcast a series of Nature Study talks to thousands of listeners in all parts of the Buck-eye State during January and February. These were given by Dr. E. E. Swine, and their subjects included: trees in winter, snow, and birds in winter. The Ohio radio school broadcasts daily from 2:00 to 3:00 p.m., on the Standard Time, over WLW of Cincinnati, and its curriculum covers all high school subjects. As an experiment in education, it has been highly successful in keeping the boys and girls of the state who are unable to attend school regularly.

Biological Station

For the twenty-third consecutive season, the University of Michigan will conduct its Biological Station on the shores of Douglas Lake this summer during the eight weeks between June 29 and August 22, and offers a complete and attractive series of courses for undergraduate and graduate students. The station is situated in the transition zone between the region of evergreen coniferous forest to the north and that of deciduous hardwood forest to the south, and is particularly rich in diverse floral life. Many species of both land and aquatic animals are found here, with avian and invertebrate fauna especially abundant. Applications for enrollment will be received by George R. LaRue, Director, at the University of Michigan at Ann Arbor, up to April 15.

Nature Poem Winners

"Songs of Mother Earth," by Edith Lomax Squires of Richmond, Indiana, was selected by the Chattanooga Writers' Club as the best Nature poem submitted from the Eastern, Middle and Western States in the contest for the Elberta Clark Walker prizes. Edith Knapp Behrman's "Woodland Peace" was awarded second prize. Among the Southern contestants, Miss Gussie Osborne of San Antonio, Texas, author of "Settled Sins," was given first place, while Emma Mas Wingfield of Richmond, Virginia, came second with "In a Garden." Most poems came from New York, California and Texas. The prizes are awarded from a fund established by Robert Sparks Walker, a Nature writer, in memory of his wife.

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Here are a few pointers to follow. All but one stable has entered two horses in this great racing classic. As you know, the color and design of the "sliks" which a jockey wears identify him as a jockey from a certain race horse owner's stable. Each owner has his own colors and designs which only jockeys from his stable may wear. Thus, it is evident, that for every jockey pictured, with one exception, there will be another jockey wearing identically the same cap, blouse, sash and trousers. For example, two and nine are twins. But, there is one jockey—AND ONLY ONE—who is dressed differently from all the others. He rides for the owner who has but one horse entered.

This picture was sketched shortly after the race started. When the jockeys had "brought their horses home" the lone entry was THE WINNER—FIRST to cross the finish line! Can you find this lone entry—the jockey who is different from all the rest? If you can Pick the Winner, by all means send his number on a postal card or by letter—Today! There are ten First Prizes to be awarded in this new publicity prize offer—ten new 1931 Chevrolet Sedans or ten prizes of \$600.00 each. There are many other extra prizes of \$100.00 each, too, for being prompt, making the ten first prizes a total of \$700.00 each. Duplicate prizes will be paid in case of ties. Answers will not be accepted from persons living outside U. S. A. or in Chicago. Send no money. There is no obligation. Just—PICK THE WINNER AND RUSH HIS NUMBER TO

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See Story on Page 216 of This Issue

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North Dakota Birds

The value of birds to the state of North Dakota is emphatically stressed in *Making Use of Our Birds*, an informative conservation booklet prepared by O. A. Stevens and issued by the Agricultural Experiment Station of the North Dakota Agricultural College. The author says, "The value of birds to agriculture, to horticulture and to forestry is a reason why they should be protected, but to many people, it is not the reason. Some estimates in dollars and cents have been made of the value of birds, but who can estimate the value of the pleasure which we derive from seeing and watching them? The return of the wild geese in the spring brings a thrill to more people than does the opening of the hunting season in the fall. The return of the first robins interests everyone, and their cheerful song from the treetops is one of the chief events of spring. The daily observation of a bird family makes an appeal to the finer qualities of human nature which can be appreciated only by those who have enjoyed such experience." The booklet discusses the economic aspects of North Dakota birds and lists the important varieties with brief descriptions of their principal traits. It is issued as Bulletin 241, a new edition of Bulletin 196.

B. C. Nature Club

Having as its object the creation of interest in the study and conservation of wild life, an organization to be known as the Summerland Field Naturalists' Club was recently established at Summerland, British Columbia. Its officers are: Honorary President, S. J. Darcus; President, William Simpson, and Secretary, Herbert M. Simpson. There are to be four divisions, botany, zoology, geology and entomology, with a leader for each. Meetings are to be held every two weeks. A membership of twenty-five has already been enrolled, with possibilities for growth unlimited. Nature Magazine cordially welcomes this club into the circle of the Nature-interested and wishes it success.

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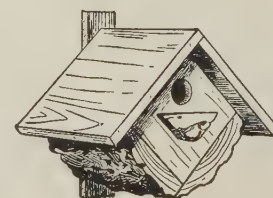
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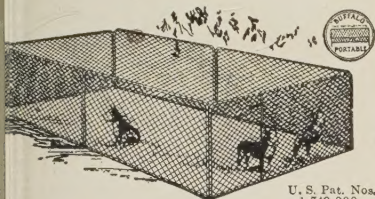
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Nature Guide Bulletin, written by Ham-
ilton M. Laing, author of several articles
appearing in Nature Magazine and the Na-
turalist who accompanied the parties
through the Canadian preserve. The bul-
letin represents Mr. Laing's studies during
the 1930 summer and is written in his
colorful style. It presents many-sided pic-
tures of the bird, mammal and flower life
of the Park in August.

New Brunswick Birds

A new list of New Brunswick birds, the
first to be prepared since Montague Cham-
berlain's list was published in 1882, has re-
cently been issued by William H. Moore
of Scotch Lake under the auspices of the
Fredericton Science Club. The list contains
326 birds observed within the Province, of
which 37 had not been recorded before. It
also contains the names of eight other birds
known to have occurred near the border of
the Province and for which local naturalists
are searching.

Light Winter

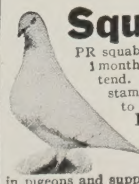
Glacier National Park had one of the
lightest winters in history this year, accord-
ing to *Glacial Drift*, which is the newly
adopted name for the Glacier Park *Nature*
Notes. The lowest temperature in Decem-
ber was but 6° below, while the snow was
unusually scanty. Belly River Camp reported
a high of 74° during the Christmas month.
It was possible to drive to the head of Lake
McDonald on the west side, and to Many
Glacier and Canada on the east side, as late
as January 20.

Rat Control

The use of red-squill powder in rat con-
trol is fully described in Leaflet No. 65,
issued by the United States Department of
Agriculture and distributed on request from
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ment. The preparation of the powder and
the methods of baiting are discussed in
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The American Tree Association stands for a constructive policy of forest protection and extension, to increase appreciation of forests as natural resources essential to the sound economic future of the country.

The Association directs encouragement of tree planting by the public; disseminates popular forestry news for the information of editors of the daily press; and compiles and distributes forestry news and reports on legislative progress for assistance of active foresters in the field.

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Head of Federated Clubs on Washington Tree Roll

BY PLANTING a tree to mark the bicentennial of the birth of George Washington, Mrs. John F. Sippel, President of the General Federation of Women's Clubs, has joined the tree-planting army and registered her tree on the national honor roll of the American Tree Association. The clubwomen throughout the country are marking the bicentennial in this way.

The Rhode Island Federation of Women's Clubs, through the department of education, is putting the program into the schools of the state. In North Dakota, the Department of Education is putting on a five-year program, using the call to plant for Washington to inaugurate the first year's campaign.

The district federated clubs with Waycross as a center will push the campaign in five counties in Georgia. The north-western section of the federation with headquarters in Endicott, Washington, has sent the tree-planting message to every club.

Martin L. Davey, whose Davey Tree Radio Hour has millions of listeners every Sunday afternoon, devoted one of his talks to the bicentennial tree-planting program of the American Tree Association. During this talk Mr. Davey said: "One of the most interesting and important activities in this campaign is being directed by the American Tree Association, to bring about the planting of ten million trees as living memorials to George Washington. I bespeak for this movement the most generous response of the people as individuals, and of all the groups who represent the patriotism of the country. The undertaking appeals to me as a thing of great merit, with wonderful possibilities,

both practical and sentimental. We have built huge monuments of cold inanimate stone to the memory of Washington, and they have served their purpose in their own way; but I doubt if anything could be quite so useful to this country as the planting of ten million living trees in honor of the first President, who helped so powerfully in moulding the foundations of the America that was to be."

Through the action of the Daughters of the American Revolution, the State of Tennessee has planted a tree to mark the bicentennial of the birth of George Washington. The registration is made with the American Tree Association by Mrs. Joseph Hayes Acklen, the State Regent of the D. A. R.

Austin F. Hawes, State Forester of Connecticut, reports appointment of a George Washington bicentennial tree-planting committee which is headed by Dr. Charles C. McCracken, president of the Connecticut Agricultural College. Other members of the committee are: Mrs. Otis G. Bunnell, Mrs. Joseph B. Jeffrey, Miss Mary R. Comstock, Edward Newmarker, James L. Goodwin, Russell F. Lund, Arthur S. Barnes, A. B. Cook, Dr. Eugene C. Peck, Chairman.

One of the biggest registrations reported to the American Tree Association comes from the Chamber of Commerce of Ranger, Texas, where the Lions Club, through the agricultural class of the high school, canvassed the town and 4,000 trees were planted. On the committee were W. C. Hickey, A. H. Seely and J. E. Meroney.



Ben Whitehouse and his vocational agricultural class that helped the Lions Club and Chamber of Commerce of Ranger, Texas in a big tree-planting program in honor of Washington

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